



Chronology of KSC and KSC Related Events for 2001

Elaine E. Liston

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FOREWORD

This 2001 Chronology is published to describe and document KSC's role in NASA's progress.

Materials for this Chronology were selected from a number of published sources. The document records KSC events of interest to historians and other researchers. Arrangement is by date of occurrence, though the source cited may be dated one or more days after the event.

Materials were researched and prepared for publication by Archivist Elaine E. Liston.

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JANUARY 2001

JANUARY 1: NASA is preparing for an active launch year with space station Alpha providing a lot of the business. The \$60 billion station is a 16-nation effort to create a 500-ton, football-field-sized science and research space outpost. The space agency plans to send six of its eight planned shuttle launches in 2001 to the station. ["NASA braces for busy year," **Florida Today**, January 1, 2001, p 1A & 3A.]

JANUARY 2: Shuttle Atlantis' mission to space station Alpha, initially set to launch Jan. 18, was scheduled for no earlier than Jan. 19, NASA managers decided over the holidays. But Atlantis faced another minor setback that could delay the launch further. The massive crawler, which delivers shuttles to their launch pads, stalled Tuesday for several hours outside the Vehicle Assembly Building as a result of a computer glitch, NASA officials said. The shuttle's move to the pad was previously delayed several weeks to examine cables in the two solid rocket boosters. ["Glitch delays shuttle rollout," **Florida Today**, Jan. 3, 2001, p 1A.]

JANUARY 3: William P. Rogers, who was attorney general in the Eisenhower administration, secretary of state under President Nixon and headed the Challenger accident commission, has died. He was 87. Rogers was last in the spotlight in 1986, when he chaired the commission that investigated the explosion of the Challenger space shuttle. ["Head of Challenger probe dies," **Florida Today**, Jan. 4, 2001, p 1A & 2A.]

◆ A reptile seen roaming Kennedy Space Center in mid-October, probably a Nile monitor lizard, still eludes capture. The fast-moving lizard was seen initially on and along State Road 3 north of Kennedy Space Center's south gate. ["KSC lizard left, died or sleeps," **Florida Today**, Jan. 4, 2001, p 10A.]

◆ Shuttle Atlantis rolled out to launch pad 39A at 3:30 p.m. The shuttle is being readied for launch to the International Space Station. Atlantis is slated to deliver the U.S. Destiny lab to space station Alpha on Jan. 19. Meanwhile four members of the Atlantis crew arrived at KSC in their T-38 training aircraft. The fifth crewmember, astronaut Marsha Ivins, had a head cold and stayed in Houston. The astronauts will practice driving escape vehicles from the launch pad in the event they have to quickly evacuate the area should an accident occur. ["NASA rolls shuttle to pad," **Florida Today**, Jan. 4, 2001, p 1A.]

JANUARY 4: The Mars Odyssey spacecraft arrived at KSC January 4 and was taken to the Spacecraft Assembly and Encapsulation Facility 2. There it will undergo final assembly and checkout, which includes installation of two of the three science instruments, integration of the three-panel solar array, and a spacecraft functional test. Launch aboard a Boeing Delta II launch vehicle from Pad A, Complex 17, CCAFS, is planned for April 7, 2001 – the first day of a 21-day planetary window. The spacecraft will arrive at Mars on Oct. 20, 2001, for insertion into an initial elliptical capture orbit. Mars Odyssey will spend two years mapping the planet's surface and measuring its environment. ["ELV Payloads Update," **KSC Countdown**, Jan. 9, 2001.]

JANUARY 6: The STS-98 payload, the U.S. Lab Destiny, was transferred to Atlantis' payload bay on Jan. 6. The lab, a key component of the International Space Station, is aluminum module 28 feet long and 14 feet in diameter. It consists of three cylindrical sections and two end cones with hatches that will be mated to other Station components. A 20-inch-diameter window is located on one side of the center module segment. It has a capacity of 24 rack locations. Payload racks will occupy 13 locations especially designed to support experiments. An exterior waffle

pattern strengthens the hull of the lab. The exterior is covered by a debris shield blanket made of material similar to that used in bulletproof vests. A thin aluminum debris shield is over the blanket for additional protection. ["Destiny closed up in Atlantis' payload bay," **KSC Countdown**, Jan. 11, 2001.]

JANUARY 9: The nation's space program will soon get a new leader, and the names of several leading candidates are swirling around Capitol Hill this week. The top names circulating on the Hill are Harrison Schmitt, the only scientist among the 12 men who walked on the moon, and David W. Thompson, chairman of Orbital Sciences Corp. in Dulles, Va. Which he has built into a \$1 billion business. Tom Young, who headed the former Martin Marietta Corp. after leading its Orlando operations, also is thought to be in the running, as is Brig. Gen. Pete Worden, the deputy director of command and control of the Air Force. Dan Goldin is the longest-serving administrator at the National Aeronautics and Space Administration, but sources said his eight-year tenure is likely to be broken. Bush press secretary Ari Fleischer said the NASA top job was on the radar screen but declined to comment further. ["Former astronaut among hopefuls for NASA chief," **Orlando Sentinel**, Jan. 10, 2001.]

◆ An Illinois man is awaiting sentencing for multiple bomb threats he telephoned to Kennedy Space Center's Launch Control Center in 1998. Jason Jerome Nurdyke, 24, pleaded guilty to the felony Dec. 15 in U.S. District Court in Orlando. He faces a maximum prison term of 10 years, a maximum fine of 250,000 and a maximum supervised release of three years. On Sunday, Nov. 22, 1998, Nurdyke made several threatening calls to operators at KSC's Launch Control Center. Workers at KSC brought in bomb-sniffing dogs to check out the threat. At the time, shuttle Endeavour was on Launch Pad 39A, being prepared for a launch to the International Space Station. ["Man awaits sentencing for KSC bomb threats," **Florida Today**, Jan. 10, 2001.]

JANUARY 10: Kennedy Space Center shuttle managers officially set Atlantis' launch for 2:11 a.m. Jan. 19, despite delays caused by inspections of the two solid rocket boosters. Some questions were raised about NASA's ability to get the shuttle ready in time. Technicians will have to work every day to make the tight launch deadline. Should Atlantis not take off during its 5-minute launch window Jan. 19, NASA could try again Jan. 20. ["NASA locks in date for shuttle," **Florida Today**, Jan. 11, 2001, p 1A.]

JANUARY 11: For the first time, commercials for the Kennedy Space Center Visitor Complex are scheduled to begin airing on national television this week. It's part of an effort to boost attendance at the Visitor Complex and sell Space Coast vacation packages. The 30-second commercial promoting the space center as a tourist destination will be shown on Cable News Network, A&E Network and the Disney Channel, said Visitor Complex Marketing Director Dan LeBlanc. Delaware North Parks Services of Spaceport, the company that runs the Visitor Complex, and Visit Florida, the state's tourism promotion agency, are paying \$1.2 million for the commercial broadcasts. In addition, Delaware North is paying \$300,000 more to show the commercial in three Florida markets: Miami, Tampa and West Palm Beach. The Visitor Complex draws more than 2.8 million visitors a year and is Brevard County's most popular tourist site. ["Space center commercial to broadcast nationwide," **Florida Today**, Jan. 12, 2001, p 3A.]

JANUARY 12: The STS-98 crew have taken time from their busy training schedule to pose for arguably the most unusual astronaut crew photo ever. The crew – commander Ken Cockrell, pilot Mark Polansky and mission specialists Robert Curbeam, Marsha Ivins and Thomas Jones – posed in leather for a NASA safety poster. "It was a lighthearted attempt by the crew to impress upon the people behind spaceflight the importance of safety," said NASA spokeswoman Eileen

Hawley. Photo technicians added the words and background for effect. About 400 of the 11-by-17-inch posters initially were printed. Those were distributed earlier this week to launch-pad workers, technicians and engineers at KSC. Demand for the poster quickly skyrocketed. ["It's leather and space: NASA poster takes off," Orlando Sentinel, Jan. 13, 2001, p A1.]

JANUARY 13: NASA may find itself in a scrap with the Smithsonian Institution over what would be the prize monument to the space shuttle program: a retired shuttle Columbia. The Smithsonian, the storehouse of American history, wants Columbia in its collection, and NASA wants it, too, when Columbia stops traveling into space. Both of the federal agencies want to put it on display. Alan Needell, chairman of the Smithsonian's Space History Departments, said Columbia is an unparalleled historical artifact that belongs with equally important spacecraft in the National Air and Space Museum's collection. The spacecraft is finishing an overhaul cycle at Boeing's Palmdale, Calif., plant and is due back at Kennedy Space Center next month. It is to make two flights this year: a research mission in August and a repair mission to the Hubble Space Telescope in November. Needell said a committee of museum and NASA officials likely will work out the best way to display the spacecraft, but a final decision is some years away. ["1st shuttle could become tug-of-war target between museum, NASA," Florida Today, Jan. 14, 2001, p 4A.]

JANUARY 15: Shuttle Atlantis' planned Friday launch to the international space station has been postponed until at least Feb. 6 to check wiring on the spaceship's twin solid rocket boosters. The suspect wiring is part of a system that detonates explosive charges used to jettison the pencil-shaped boosters two minutes after liftoff. Brittle wiring caused one of the charges to fail during the Nov. 30 liftoff of sister ship Endeavour. A backup charge detonated as planned, saving the shuttle from near-certain disaster. Atlantis's booster wiring was inspected and X-rayed for similar problems before the ship was rolled out to the launch pad Jan. 3. However, engineers testing hundreds of other cables in the shuttle fleet discovered four last week where the flow of current occasionally flickered when the cables were wiggled to simulate vibrations during launch. "We don't know if there is anything wrong or not," KSC spokesman George Diller said. "But since we don't take avoidable risks, we're going to check this out." Shuttle officials plan to complete the wiggle tests by Monday. If all goes well, Atlantis would be rolled back to the pad Jan. 25. Launch would be rescheduled for no earlier than Feb. 6. ["Atlantis launch is pushed back," Orlando Sentinel, Jan. 16, 2001, p A3.]

JANUARY 16: Shuttle Atlantis' return to the Vehicle Assembly Building will mean another hectic few weeks for Kennedy Space Center's work force, shuttle managers said. Technicians with United Space Alliance and NASA managers had been working around-the-clock since Jan. 2 testing and preparing Atlantis for a Friday launch. That effort has shifted now to first get the shuttle back inside the Vehicle Assembly Building, test key cables on the solid rocket boosters, and return it to the launch pad for a Feb. 6 liftoff. Keeping the new launch date will mean returning Atlantis to launch pad 39A by Jan. 25 and readying the spacecraft in 12 days. NASA likes to roll its orbiters to the launch pad 30 days before liftoff. NASA plans eight launches in 2001. Plans were not set to operate a round-the-clock schedule to get Atlantis ready to launch, NASA spokesman Joel Wells said. In the shuttle's nearly 20-year history, NASA has hauled it back from the launch pad only 13 times. ["KSC work force shifts efforts," Florida Today, Jan. 17, 2001, p 1A & 4A.]

◆ The Russian government has tentatively set March 6 as the date for the destruction of the Mir space station in a controlled collision with Earth's atmosphere, a Russian space official said. Some parts of the 140-ton station are expected to survive re-entry and splash down in the Pacific

Ocean east of Australia. ["Mir's descent tentatively scheduled for March 6," **Florida Today**, Jan. 17, 2001, p 4A.]

JANUARY 18: Work continues on Space Station modules destined for future flights. In the Space Station Processing Facility, workers have been installing laboratory racks inside the Multi-Purpose Logistics Module Leonardo, scheduled to launch in early March on mission STS-102. Leonardo is the first of three pressurized modules that will carry laboratory racks filled with equipment, experiments and supplies to and from the Space Station on the Space Shuttle. ["ISS Update," **KSC Countdown**, Jan. 18, 2001.]

◆ The General Accounting Office maintains in a new report that space station Alpha will run about \$35 billion over cost. GAO, the investigative arm of Congress, said the space agency continues to let contractors run up costs despite past demands for more oversight by NASA. It also found the agency lacks key people in its shuttle work force and risks future robotic probe failures. The report, similar to one issued by the GAO last September, was offered as a primer for President-elect Bush. The GAO said Alpha likely will cost \$95 billion to build and operate for 15 years. NASA Administrator Dan Goldin said last summer the total cost would be \$60 billion. ["Station may run \$35 billion over budget," **Florida Today**, Jan. 19, 2001, p 1A & 2A.]

JANUARY 19: Kennedy Space Center is accepting requests for free shuttle launch vehicle passes after a two-year wait, Kennedy Space Center spokeswoman, Patti Beck said. "It's taken two years to get rid of the backlog since the (John) Glenn launch," she said. The vehicle passes allow visitors to view the launches from the NASA Causeway. ["KSC resumes taking launch pass requests," **Florida Today**, Jan. 20, 2001, p 1A.]

◆ Shuttle Atlantis re-entered Kennedy Space Center's Vehicle Assembly Building at 2:25 p.m. today for more cable inspections on its solid rocket boosters. Workers are expected to remove an outer covering on part of the boosters to get to the cables in question. Recent tests on Kennedy Space Center's stock of data cables used on the shuttle's solid fueled boosters revealed four failures out of more than 3,000 tests. When no one could vouch entirely for the integrity of the cables on Atlantis' rockets, Shuttle Program Manager Ron Dittemore ordered the tests. If any cables have to be replaced, the shuttle's return to the pad could be delayed and the launch pushed back further. ["Shuttle rolls back for cable tests," **Florida Today**, Jan. 20, 2001, p 1A.]

JANUARY 22: The gleaming, \$6.2 million Space Mirror memorial to fallen astronauts at Kennedy Space Center will not be fully operational when the country observes the 15th anniversary of the Challenger accident next week. The national monument officially lost one of its most intriguing features – an ability to automatically follow the sun across the horizon – after a non-profit foundation decided money to repair a broken tracking system would be better spent on educational programs. The monument was dedicated in 1991. [Memorial repairs delayed indefinitely," **Florida Today**, Jan. 23, 2001, p 1A & 3A.]

JANUARY 23: NASA might not keep its ambitious schedule of eight launches this year, Kennedy Space Center's director said. But the shuttle fleet should complete its six missions to space station Alpha. Shuttle Columbia, the oldest orbiter in the fleet, was slated to make two flights this year, but likely will make only one launch, KSC Director Roy Bridges said. "The ones going to the station are solid," Bridges said. Columbia has been undergoing an overhaul at Boeing's Palmdale, Calif., plant since September 1999. It is expected to return to KSC next month. The overhaul originally was to take 10 months, but instead has taken 17 months to complete. It will take another 210 days to ready the orbiter for launch. ["Delays shuffle shuttle schedule," **Florida Today**, Jan. 24, 2001, p 1A.]

◆ Ed Gormel was named executive director of Spaceport Florida Authority. Gormel replaces Edward A. O'Connor Jr., who retired in September after 10 years of serving as head of the agency that supports and oversees the state's space industry. Gormel has served as director of the Eastern Test Range, executive director of the NASA/Air Force Joint Performance Management office at Cape Canaveral Spaceport and director of plans for the Air Force's 45th Space Wing. The Spaceport Authority runs three of its own launch complexes, a launch control center and a vehicle hangar, among other facilities. The agency also supports Florida's space industry through educational programs in the state's universities and community colleges. ["Spaceport Florida Authority head named," **Florida Today**, Jan. 24, 2001, p 2A.]

JANUARY 25: A string of upcoming shuttle launches has been delayed several days, NASA officials said. The next launch of space shuttle Atlantis has been delayed another day to 6:11 p.m. Feb. 7. The new launch date means a scheduled landing at 1:39 p.m. Feb. 18. The shuttle's expected launch date had been bumped from Jan. 18 to Jan. 19 to Feb 6 because of extra testing required of its solid rocket cables. The latest delay was because of NASA's desire to dock with space station Alpha on the third day of flight. If Atlantis launched on Feb. 6, it would have taken a day longer to catch the station leaving less time for other critical tasks. Atlantis' primary goal is to attach and activate the \$1.4 billion U.S. laboratory Destiny to Alpha. ["Delays vex shuttle schedule," **Florida Today**, Jan. 26, 2001, p 1A.]

JANUARY 26: Space shuttle Atlantis made the familiar, 3.5-mile trip to Launch Pad 39A. Atlantis sat on the pad earlier this month, but NASA managers decided to move it back into the Vehicle Assembly Building when the shuttle's two solid rocket boosters required additional cable inspections. The inspections revealed nothing awry. Atlantis left the VAB at 7 a.m. and arrived at the pad at 12:44 p.m. The orbiter's main cargo, the U.S. laboratory Destiny, was waiting for it on the pad. It will be reinstalled in Atlantis' payload bay Jan. 28. The primary goal of the mission is to attach the laboratory to space station Alpha and activate it. ["Shuttle returns to launch pad," **Florida Today**, Jan. 27, 2001, p 1B.]

◆ Air Force officials delayed the launch of a Titan 4B rocket indefinitely Friday after questions were raised about its navigation controls. The rocket, which most recently was scheduled to lift off Feb. 4, eventually will carry the fourth Military Strategic and Tactical Relay-2 communication satellite into orbit. Ken Warren, spokesman for the 45th Space Wing at Patrick Air Force Base, said a navigation unit similar to the unit on the Titan failed a test at the Lockheed Martin/Honeywell factory in Clearwater. The failure prompted Air Force officials to delay the launch indefinitely. ["Another problem delays Titan rocket liftoff," **Florida Today**, Jan. 27, 2001, p 1A.]

JANUARY 28: Fifteen years ago on this date, the space shuttle Challenger was destroyed during launch along with seven crew members, Richard Scobee, Michael Smith, Ronald McNair, Judith Resnik, Ellison Onizuka, Gregory Jarvis and Christa McAuliffe. Kennedy Space Center is remembering Apollo 1 (Jan. 27, 1967) and Challenger (Jan. 28, 1986) by flying its flags at half-staff Jan. 27 & Jan. 28. A memorial service for the Challenger crew will be at 2:30 p.m. today at the Astronaut Memorial Plaza at Sand Point Park in Titusville. Former astronaut Andrew Allen, the technical director of the shuttle fleet's Florida Operations with United Space Alliance, will be the featured speaker. Astronaut Alan Poindexter also will attend. ["Brevard remembers Challenger," **Florida Today**, Jan. 28, 2001, p 1A & 5A.]

◆ A hectic shuttle schedule and a host of NASA satellites will mean a lot of rockets crossing through the skies above the space coast, Kennedy Space Center's director said. Some 34

spacecraft are to launch from KSC or the adjacent Cape Canaveral Air Force Station this year. In addition to its shuttle fleet, NASA is excited about several unmanned missions, particularly the Mars Odyssey. The craft will be the first Mars probe launched since the space agency lost two Mars explorers in 1999. Seven NASA missions are to be launched from the Cape, but six others launched from Vandenberg Air Force Base, Calif., and Alaska are to be controlled by Kennedy operators. That will give KSC 13 missions to monitor. ["Space Coast to host 34 launches in 2001," **Florida Today**, Jan. 29, 2001, p 1A.]

◆ Effective January 28, 2001, Mr. Stephen M. Francois is reassigned as Manager, ELV and Payload Carriers Programs. Mr. Francois replaces Mr. Bobby G. Bruckner, who retired on January 3, 2001. ["Reassignment of Mr. Stephen M. Francois to the Manager, ELV and Payload Carriers Programs," Memo from AA/Director, Jan. 25, 2001.]

JANUARY 30: A ground-breaking ceremony for the Space Experiment Research and Processing Laboratory (SERPL) and Space Commerce Way will take place on Thursday, Feb. 8, at 2 p.m., followed by a reception at the Debus Conference Facility. Florida's Lt. Gov. Brogan and Center Director Roy Bridges are planning to participate in the ceremony. SERPL is a collaborative effort with the State of Florida, including Spaceport Florida Authority and the Florida Space Research Institute, that will offer a world-class laboratory to host biological and life sciences research as well as Space Station experiment processing. Space Commerce Way is the road that will lead from S.R. 3 through the planned Space Station Commerce Park to S.R. 405 near the KSC Visitor Complex. The road will provide 24-hour access through KSC for the first time. ["KSC to break ground for construction of new road, building," **KSC Countdown**, Jan. 30, 2001.]

◆ With the launch and deployment of another Global Positioning System satellite, Maj. Nina Armagno became Cape Canaveral Air Force Station's first female launch director. Armagno led the 400-person launch team through the countdown. She had the authority to delay the mission or launch during the final 10 minutes before liftoff. The Boeing Delta 2 rocket successfully launched at 2:55 a.m. ["First woman directs launch," **Florida Today**, Jan. 31, 2001, p 1B.]

◆ Dennis Tito, the aspiring world's first space tourist, has signed a contract with the Russian Space Agency, the Gagarin Cosmonauts Training Center and RSC Energia that will put him on a Soyuz spacecraft bound for the International Space Station on April 30, 2001. Tito's fellow crew members on the mission will be Talgat Musabayev (mission commander) and Yuri Baturin (flight engineer). ["Would-be space tourist signs deal," **Florida Today**, Jan. 31, 2001, p 6A.]

JANUARY 31: The crew of the International Space Station received permission to call the station Alpha. Formally, however, the outpost remains the International Space Station. Commander Bill Shepherd and Russian cosmonauts Yuri Gidzenko and Sergei Krikalev named the complex Alpha when they boarded the craft Nov. 2. Shepherd said before the crew's launch that a ship should have a name and it surprised few that he asked NASA Administrator Dan Goldin for permission to use the Alpha name the day the crew floated inside. Since then, Shepherd said the name should stick for the whole spacecraft, not just his crew. Other astronauts and cosmonauts agree. In the meantime, Alpha's crew is preparing the station for the arrival of its next major piece late next week. The Alpha members are to remain on the station until mid-March when shuttle Discovery is to carry their replacements up and bring the current crew back. ["NASA yields to Alpha name," **Florida Today**, Feb. 1, 2001, p 1A & 2A.]

DURING JANUARY: NASA has established a Second Generation Reusable Launch Vehicle program office at Marshall Space Flight Center in Huntsville, Ala., as part of the agency's Space

Launch Initiative. The program office, intended to identify requirements and develop technologies needed for second generation RLVs, is seeking proposals from industry and academic institutions to reduce associated technical and business risks for a launch system that could enter development in 2005. ["Program office created," **Aviation Week & Space Technology**, Jan. 22, 2001, p 17.]

◆ The Voyager 1 spacecraft might reach the beginning of the boundary region dividing the solar system and interstellar space sometime between early next year and the end of 2003. Voyager 1, the farthest human-made object from Earth, was launched in 1977 from Cape Canaveral. Its twin, Voyager 2, is about 80% as distant as Voyager 1. ["Voyager 1 progresses," **Aviation Week & Space Technology**, Jan. 8, 2001, p 17.]

◆ NASA is pressing ahead with plans for a string of technology upgrades for the space shuttle to ensure the 20-year-old hypersonic space transport remains safe and operational beyond 2010. Between now and 2005, the space agency hopes to spend nearly \$1.6 billion on safety improvements that will affect nearly every aspect of the shuttle system. Those include changes to the orbiter, solid rocket boosters and the external tank. NASA also plans to spend another \$630 million to upgrade checkout and launch operations at Kennedy Space Center. The \$2.2-billion overhaul will build on several hundred safety improvements put in place after the 1986 Challenger accident. NASA believes the latest set of improvements is necessary to allow the shuttle to fly safely until at least 2012. ["Shuttle Upgrades 'Crucial' for Astronaut Safety," **Aviation Week & Space Technology**, Jan. 8, 2001, p 55.]

FEBRUARY 2001

FEBRUARY 1: Launch countdown for STS-98 begins 10 p.m. Sunday, Feb. 4. The crew is scheduled to arrive at KSC earlier on Sunday, about 1:30 p.m., for final launch preparation. The 11-day mission to the International Space Station will include three spacewalks to complete assembly of the U.S. Laboratory Destiny to the Station. Launch is scheduled for Feb. 7 at 6:11 p.m. and a landing at KSC is on Feb. 18 at 1:38 p.m. ["Launch countdown begins Sunday, Feb. 4," **KSC Countdown**, Feb. 1, 2001.]

◆ The last of three reusable modules that will be used to carry supplies to space station Alpha arrived at Kennedy Space Center on Thursday. Named Donatello, the Italian-made segment is not to fly for a couple of years while technicians prepare it for missions. Donatello joins its identical twins, 21-foot-long Leonardo and Raffaello on the floor of the Space Station Processing Facility. All three will take turns flying to the station aboard shuttles. Slightly shorter than the U.S. Destiny Laboratory, the modules are designed to hold computer and experiment racks safely during launch and landing. The modules will be attached to the station long enough for astronauts to switch old racks for new. Leonardo is to make its first trip to Alpha in March. Raffaello is to follow in April. ["Third reusable module arrives at space center," **Florida Today**, February 3, 2001, p 1B.]

FEBRUARY 3: Workers at the Kennedy Space Center are working to prepare the \$151 million Mars Odyssey orbiter for its planned April 7 launch. The orbiter's liftoff will be the first to the Red Planet since the failed Mars Climate Orbiter and the Mars Polar Lander missions in 1999. The orbiter, to be launched with a Boeing Delta II rocket, is to begin orbiting Mars in late October after the six-month trip from Earth. ["Odyssey seeks discovery," **Orlando Sentinel**, February 4, 2001, p G7.]

FEBRUARY 4: The four-man, one-woman crew of shuttle Atlantis arrived at chilly Kennedy Space Center on Sunday to make final preparations for their Wednesday launch to space station Alpha. Air Force weather officers are forecasting an 80 percent chance that weather will not interfere with the planned 6:11 p.m. launch. The only concern is a chance of coastal showers. Before Atlantis lifts off, two of the shuttle's three space suits used for space walks must be replaced. Last week, workers found that a plug in a primary oxygen regulator in one of the suits did not work properly. So that suit will be replaced with one set to fly on shuttle Discovery in March. The two new suits arrived Sunday at Patrick Air Force Base. The countdown clocks for the launch began at 10 p.m. Sunday. ["Crew, new space suits arrive for Atlantis launch," **Florida Today**, February 5, 2001, p 1A.]

FEBRUARY 7: A quick turnaround and questions about rocket boosters since September combined to test NASA's work force leading to tonight's planned launch of Atlantis. The shuttle, first launched in October 1985, will make its third trip to space station Alpha since May 2000. Keeping that pace for Atlantis, Discovery and Endeavour is crucial if the space agency is to meet its station construction goals. It takes NASA and United Space Alliance workers at least four months to perform the 2 million steps needed to ready a shuttle for launch. There have been problems with the schedule, however, because of questions about the two solid-fueled rockets Atlantis and its crew of five will ride for the first leg of the launch. The booster questions will likely lead to changes in the inspection routines technicians perform before shuttles are moved to their launch pads. Shuttle Program Manager Ron Dittemore said the technicians at KSC can keep to the ambitious schedule. NASA planned eight missions for this year, but that was cut back to

seven when it became known that Columbia would fly only once this year, not twice. [“Ambitious pace critical for construction goals,” **Florida Today**, February 7, 2001, p 5A.]

◆ Space Shuttle Atlantis lifted off Launch Pad 39A on mission STS-98 at 6:13 p.m. The crew of five is delivering a key module – the U.S. Laboratory Destiny – to the growing International Space Station. Destiny will be attached to the Unity node using the Shuttle’s robotic arm. Three spacewalks are required to complete the planned construction work. The STS-98 crew comprises Commander Ken Cockrell, Pilot Mark Polansky and Mission Specialists Robert Curbeam, Thomas Jones and Marsha Ivins. Curbeam and Jones will be doing the construction in space. Ivins will manipulate the robotic arm from inside Atlantis. [“Atlantis and crew headed to Space Station with major component,” **KSC Countdown**, February 8, 2001.]

◆ Center Director Roy Bridges and Lt. Gov. Frank T. Brogan will kick off the start of a construction project that will serve KSC and the State through the new millennium. They will break ground at the site of a new road to be built, Space Commerce Way, from S.R. 3 and near the location planned for the Space Experiment Research and Processing Laboratory (SERPL). The road will provide 24-hour access through KSC and a proposed Space Commerce Park to the KSC Visitor Complex. [“KSC and State of Florida join to build technology center for the future,” **KSC Countdown**, February 8, 2001.]

FEBRUARY 8: Technical prowess has long defined Kennedy Space Center. NASA and state officials hope a new \$47 million laboratory will make scientific study a hallmark of the Cape in the near future. Florida is to pay \$30 million for the effort, with NASA picking up the rest. The 100,000-square-foot laboratory will be used to prepare experiments for launch and analyze the results when the return. That kind of work is now done in a 1950’s era hangar. Those facilities are stressed during a scientific mission and do not offer advanced equipment for researchers. They would not hold up under the strain of constant experimental missions on space station Alpha. It will take two years to build the laboratory and the first experiments prepared there are not expected to begin until 2004. [“New lab keeps KSC on science front line,” **Florida Today**, February 9, 2001, p 3A.]

◆ Long-term safety improvements to the space shuttle are needed because short-term prospects for a successor are grim, according to a report released Thursday by a NASA advisory group. Efforts to design and finance a next-generation ship are going nowhere. That means the shuttle must be available to build and support the international space station for another 15 to 20 years. To do that, the panel says, NASA needs to start planning long-range upgrades to the fleet now. “A timely commitment to space shuttle operations for the life of the [space station] from NASA, the administration and Congress is essential to the long-term safety.” That recommendation was the key finding in an annual report by NASA’s Aerospace Safety Advisory Panel. The nine-member group of industry experts was established by Congress in 1967 after three Apollo astronauts died in a launch pad fire at Kennedy Space Center. This year’s report proposed two shuttle upgrades: an improved crew-escape system and changes to the ships’ hydraulics to ensure a single failure couldn’t knock out the primary and backup lines. The report also suggested renovating critical ground infrastructure at KSC. Most of the cape’s facilities and equipment are more than 20 years old. KSC shuttle officials welcomed the finds as validation of the programs reviewed emphasis on safety. [“Safety overhaul urged for shuttles,” **Orlando Sentinel**, February 9, 2001, p A8.]

FEBRUARY 11: Shuttle Columbia could find itself hosting Defense Department satellites and experiments soon, while other shuttles build space station Alpha. NASA last flew a Pentagon mission in December 1992, aboard Discovery. Since then, shuttle missions have remained

civilian: launching space probes, performing experiments and taking astronauts to space stations. Over the past couple of years, however, Defense Department and NASA planners have returned to the idea of flying national security missions again. Columbia, which first flew in April 1981, is a logical choice for such missions because it's too heavy to carry new pieces to the growing space station. It can be used to ferry new crews and supplies to the station, but Shuttle Program Manager Ron Dittmore said the three other orbiters are better equipped for those missions. The shuttle was designed with military payloads in mind. After the Challenger disaster, the Rogers Commission argued against using the shuttle to put satellites in orbit because it put astronauts at risk. Pentagon missions flown on the shuttle have dealt with satellites that were too large for any other rocket. The renewed interest in using Columbia comes as the military is reasserting itself in the realm of space warfare. ["Military may again seek shuttle use," **Florida Today**, February 12, 2001, p 1A & 3A.]

FEBRUARY 12: A fog-shrouded Space Shuttle Discovery rolled to Launch Pad 39B to prepared for mission STS-102. Its payload is the Multi-Purpose Logistics Module Leonardo. Endeavour is in OPF bay 2 under going testing for mission STS-100 in April. That mission will carry the MPLM Raffaello as well as the Canadian arm, SSRMS. ["Upcoming missions will carry cargo "vans" to Space Station," **KSC Countdown**, February 13, 2001.]

◆ In the first successful attempt to land a spacecraft on an asteroid, NASA steered the NEAR Shoemaker craft to a soft touchdown on barren Eros on Monday. The vehicle, a scientific orbiter, was not designed to land. ["Landing occurred at 3 mph," **Orlando Sentinel**, February 13, 2001, p A1 & A-10.]

FEBRUARY 14: Shuttle Atlantis astronauts Bob Curbeam and Tom Jones completed NASA's 100th space walk Wednesday, almost 36 years after Ed White first floated outside his Gemini 4 capsule. ["Atlantis crew hits milestone," **Florida Today**, February 15, 2001, p 1A.]

FEBRUARY 16: The International Space Station could cost American taxpayers an additional \$4 billion to complete. That's bad news for a project plagued with cost overruns and delays after it seemed to be getting back on track with the delivery of the U.S.-built Destiny Laboratory module. If accurate, that would put the development cost of the orbiting research facility at \$28.2 billion, a 62 percent increase since 1993, when NASA redesigned the station and said it could finish the project for \$17.4 billion. With the Bush administration putting together its budget request and Capitol Hill lawmakers settling into new assignments, NASA headquarters officials have been making the rounds with the startling numbers. Friday, headquarters managers put space centers in Florida, Alabama, Texas, California and elsewhere on notice that their budgets were going to get cut to feed the space station's growing appetite. Kennedy Space Center spokesman George Diller said the center is waiting to see what effect the space station budget crisis will have on KSC. ["Space station could cost another \$4 billion," **Florida Today**, February 17, 2001, p 1A & 3A.]

◆ The Technological Research and Development Authority will build an alternative-fuel station at Kennedy Space Center to service the growing fleet of vehicles at the center that use ethanol-85 gasoline. If the project goes as planned, the station eventually could become a fuel site for vehicles at Patrick Air Force Base as well as those at KSC. Approval for the project follows the authority's receipt of \$93,034 grant from the U.S. Department of Energy's Office of Technologies. The Titusville project was one of three in the nation selected by the Energy Department for grants. The goal in bringing the project to KSC is to help remove the barriers to alternative fuel use there, by developing the support systems needed to successfully use alternative-fuel vehicles, said Dave Kershaw, energy program manager with the Technological

Research and Development Authority. KSC has about 50 vehicles that use 35,000 gallons of ethanol-85 fuel annually, and is expected to add 100 more ethanol-85 fueled vehicles this year. ["Alternative-fuel station will supply space center vehicles," **Florida Today**, February 17, 2001, p 1C.]

FEBRUARY 18: Shuttle Atlantis stayed in space an extra day because of high winds at Kennedy Space Center's landing strip. Atlantis is now expected to touch down at 1:26 p.m. Monday at KSC. It could also land there at 3:02 p.m. or at Edwards Air Force Base, Calif., at 4:33 p.m. or 6:09 p.m. However, weather does not look favorable for a California landing. The first chance to land at KSC on Sunday was at 12:53 p.m., but NASA decided to wait for another orbit because of high crosswinds at the shuttle landing strip. Crosswinds, or winds blowing across the runway, peaked at 25 mph. The crosswind limit for landing is 17 mph. The shuttle's second chance, about 2 p.m., wasn't much better, with crosswinds holding steady. ["Atlantis to try for KSC landing again today," **Florida Today**, February 19, 2001, p 1A.]

FEBRUARY 19: Shuttle Atlantis' five astronauts spent another day in orbit after high winds and approaching clouds at Kennedy Space Center postponed landing for a second day. NASA will try to bring the shuttle back to KSC Tuesday. Britain's former Prime Minister Margaret Thatcher was taking a tour at KSC on Tuesday but missed her chance to see a landing. ["NASA plans 3rd try to land Atlantis," **Florida Today**, February 20, 2001, p 1A & 2A. "Atlantis lands in California," **Florida Today**, February 21, 2001, p 1A.]

FEBRUARY 20: Shuttle Atlantis ended a 13-day mission at 3:33 p.m. at Edwards Air Force Base, Calif., one of two back-up landing sites. For the third straight day, NASA managers struck Florida's Kennedy Space Center as a possible landing site because of weather. High winds prevented landing Sunday and Monday. This time, it was a thick blanket of low clouds that could have obscured the shuttle's view of the runway on both chances to land. Discovery was the last shuttle to land at Edwards because of bad weather at KSC in October. It could be about a week before Atlantis returns to KSC. ["Atlantis lands in California," **Florida Today**, February 21, 2001, p 1A.]

FEBRUARY 21: Shuttle Columbia, which has been at a Boeing plant in Palmdale, Calif., since 1999 getting an overhaul, is to leave the plant Saturday atop a modified Boeing 747. Plans call for the fleet's oldest shuttle to stop overnight in Houston and arrive at Kennedy Space Center sometime Sunday. That is if weather holds up and there are no technical problems, said Joel Wells, a NASA spokesman. The veteran shuttle was supposed to be overhauled for 10 months, but it has been in Palmdale for 17 months. NASA's other modified 747 will be used Wednesday for shuttle Atlantis, which wrapped up its mission to space station Alpha on Tuesday. The shuttle is awaiting its return from Edwards Air Force Base, Calif. It landed there because of approaching clouds in the KSC area. NASA managers will have a weather briefing later this week to finalize plans. ["Shuttle fleet to move around next week," **Florida Today**, February 22, 2001, p 7A.]

FEBRUARY 23: The Air Force Titan 4B launch has been rescheduled for no earlier than 1:57 p.m. Tuesday. The Lockheed Martin-built rocket, carrying a \$750 million MILSTAR communications satellite has had five other delays. ["Titan liftoff delayed again; Tuesday liftoff possible," **Florida Today**, February 24, 2001, p 1A.]

◆ George Abbey, longtime Director of Johnson Space Center and one of the most powerful figures in NASA, has been re-assigned as senior assistant for international issues at NASA headquarters, the agency announced Friday. Roy Estess, director of NASA's Stennis Space

Center in Mississippi, will act as director of JSC. [“Johnson Space Center director reassigned,” **Florida Today**, February 25, 2001, p 5A.]

FEBRUARY 27: A Titan 4B rocket launched from Cape Canaveral Air Force Station Pad 40 at 4:20 p.m. Its cargo was a \$800 million MILSTAR 2 communications satellite. [“Rocket launches with satellite,” **Florida Today**, February 28, 2001, p 1B.]

FEBRUARY 28: Dealing with a \$4 billion International Space Station budget overrun is the centerpiece of U.S. President George W. Bush’s 2002 spending blueprint for NASA released today. Bush’s plan “A Blueprint for New Beginnings” provides \$14.5 billion for NASA – a 2-percent increase over 2001 – while acknowledging approximately \$1 billion in space station cost growth in 2001 and 2002 and \$4 billion for the next five years. The blueprint directs NASA to “aggressively pursue space shuttle privatization opportunities that improve the shuttle’s safety and operational efficiency.” This would include reducing the number of civil servants working on shuttle by making them employees of United Space Alliance. NASA’s Space Launch Initiative, the agency’s potential space shuttle replacement, stands to fare well under the president’s budget with a promised 64-percent increase over the program’s \$290 million budget in 2001. [Web posted. (2001). Bush Budget Plan recommends Sweeping Changes at NASA [Online]. Available WWW: <http://www.space.com/> [2001, February 29].]

DURING FEBRUARY: NASA recently announced that it is exercising a contract option with the Boeing Company for a Delta II vehicle to launch the Mars Exploration Rover 2 (MER-B). The spacecraft is scheduled for launch at the beginning of a 21-day planetary window that opens on June 27, 2003. This firm-fixed price option is covered under the NASA Launch Services contract officially awarded by NASA’s Kennedy Space Center in June 16, 2000 to Delta Launch Services, Inc., Huntington Beach, CA. NASA’s total launch services budget for the MER-B campaign is approximately \$68 million. [“NASA exercises Delta II contract option for Mars 2003 rover,” **Brevard Technical Journal**, February 2001, p 4.]

MARCH 2001

MARCH 2: NASA will reduce the amount of science performed on the International Space Station, a senior NASA official said Friday. The move is an indication that a \$4 billion cost overrun in space station development and construction is cutting the \$96 billion outpost to its very core: science and research. "There will be research restraints for at least some time," said Michael Hawes, space station director. "It's going to be a difference kind of science program." In the process, NASA committed to at least another 15 years of shuttle use. The shuttle will celebrate its 20th anniversary April 12. Cutbacks in science and research are directly linked to the cancellation of the space station's habitation module and a crew return vehicle. ["Research on station scaled back," **Florida Today**, March 2, 2001.]

◆ Weather foiled Brevard County's chance Friday to see two shuttles flying into Kennedy Space Center. Thick cloud cover in Oklahoma and Texas, where shuttles Atlantis and Columbia stayed Thursday night, prevented them from taking off for Florida. ["Shuttles' returns delayed," **Florida Today**, March 3, 2001.]

MARCH 4: The next crew of space station Alpha arrived Sunday night at Kennedy Space Center along with the shuttle crew that will take them there. Russian cosmonaut Yury Usachev and American astronauts James Voss and Susan Helms will replace Bill Shepherd, Yuri Gidzenko and Sergei Krikalev who have lived aboard the outpost since November 2000. Jim Wetherbee, Jim Kelly, Paul Richards and Andy Thomas will launch and return on shuttle Discovery, dropping off the Expedition Two crew and providing a ride home for the first station crew. Discovery is set to launch at 6:42 a.m. Thursday on a 12-day flight. It will return March 20. ["Station's new crew lands at KSC," **Florida Today**, March 5, 2001.]

MARCH 7: Russian space officials on Wednesday set March 20 for dumping the Mir space station, saying they want to wait until the craft drifts closer to Earth before giving it a final shove toward a fiery plunge into the Pacific Ocean. ["Russians set Mir's plunge for March 20," **Orlando Sentinel**, March 8, 2001, p A4.]

◆ Kennedy Space Center's civil service staff has been told to turn all of its attention to space shuttle and space station Alpha operations even if it means putting off other projects for a few years, according to a memo from center director Roy Bridges. The memo, dated Feb. 21, warns of consequences for the \$96 billion science outpost in case budget woes are not eased during the next several years. "Without a good solution, we may find the Station will not live up to expectations," Bridges said in the page-long note to NASA employees. "That will have long-term implications for NASA with the Administration, the Congress, our international partners, and the American people. More importantly, our civilization will be denied the many significant benefits we believe will come from the research planned on the Station over the next 15 to 20 years," He clearly stated in the memo that managers at NASA Headquarters in Washington, D. C. "complimented" KSC for its planning and focus. "Nevertheless, we must find ways to help the agency solve this very critical problem," Bridges said. ["Director asks staff to put off other projects," **Florida Today**, March 8, 2001, p 1A & 3A.]

◆ Forrest S. McCartney, known for his key roles in restoring the space shuttle program and overseeing military and commercial rocket launches, has retired as vice president of Lockheed Martin Launch Operations, the company announced Wednesday. McCartney, 69, steps down after seven years of leading Lockheed Martin's Titan, Atlas, Athena and Multiple Services Launch System launch programs at Cape Canaveral Air Force Station and Vandenberg Air Force

Base, California. From 1986 through 1991, McCartney was the director of Kennedy Space Center, where he led NASA's effort to rebuild the space shuttle program after the 1986 Challenger explosion, which killed seven astronauts. "During Forrest's extraordinary aerospace career, he made vital contributions to programs within the Air Force, NASA and Lockheed Martin that have contributed directly to our national security and have helped make the United States a leader in space and technology," said G. Thomas Marsh, president of Lockheed Martin's Space Systems Company Astronautics Operation. McCartney said he retired, effective March 2, because he thought it was time to focus on other things. Regarding his tenure as the Space Center's director, McCartney said it was "a privilege to be on the team that took the necessary action to return the space shuttle to flight." During his tenure with Lockheed Martin, he oversaw 84 launches, including 54 consecutive successful launches. ["McCartney leaves Lockheed post," Florida Today, March 8, 2001, p 2A.]

MARCH 8: Discovery and a crew of seven blasted off Launch Complex 39B into a clear Florida sky on mission STS-102. Liftoff was at 6:42 a.m. EST. Heading for the International Space Station, the shuttle carries the first of the Multi-Purpose Logistics Modules, Leonardo, containing racks of science experiments for the U.S. Laboratory Destiny and supplies that will be offloaded into the Station. Leonardo carries the Human Research Facility, the first research payload to be installed in the U.S. Laboratory. Three of the crew members on the mission are also the Expedition Two crew – James Voss, Susan Helms and Russian cosmonaut Yury Usachev – who will replace Expedition One. The first resident crew on the Station, Expedition One will return to Earth aboard Discovery. Landing at KSC is scheduled for March 20 at 2:02 a.m. EST. ["Discovery launches on time on mission STS-102," **KSC Countdown**, March 8, 2001.]

MARCH 9: A new agreement between NASA and an independent institute could mean high-tech training on the Internet for those in the space industry. For the military Web-based program, NASA agreed to add \$500,000 to Florida Space Research Institute's \$1.4 million contract with the state. The program, which initially targets cryogenic engineering, will be implemented over a two-year period. ["NASA may help build Web-based training," Florida Today, March 10, 2001, p 3A.]

MARCH 10: Discovery docked with the International Space Station at 1:38 a.m., about an hour later than planned, as the two craft soared 235 miles above the Atlantic Ocean southeast of KSC. A balky latch on one of the station's American solar wings forced the shuttle crew to hover 400 feet in front of the outpost until the glitch could be fixed. ["Alpha's 1st residents welcome new crew," Florida Today, March 11, 2001, p 2A.]

MARCH 14: NASA on Wednesday completed the first in a series of free-flights of the unmanned X-40A to test systems for a reusable spacecraft that will be launched aboard the space shuttle but return to Earth independently like an airplane. ["X-plane flight is a success," Florida Today, March 15, 2001, p 2A.]

MARCH 15: The launch and landing times for Space Shuttle Endeavour on mission STS-100 have changed. Launch is now scheduled for 3:12 p.m. EDT on April 19; landing is scheduled for 11:10 a.m. on April 30. ["Mission Update," **KSC Countdown**, March 15, 2001.]

◆ The deorbit of the Mir Space Station is currently targeted for about 1:30 a.m. March 22. [**KSC Countdown**, March 15, 2001.]

◆ United Space Alliance will pay about \$9 million more than it planned for space shuttle-related overtime this budget year if it continues working at its current pace, company officials

said. The rate is within NASA's guidelines, but Howard DeCastro, USA's vice president and program manager, blames the unplanned overtime, in part, on a launch surge that has seen six shuttle launches since September, and will see three more by July. He said weather and equipment problems are also to blame. USA has prepared shuttles for launch since 1995 under a contract with NASA. The company, a joint venture between Boeing Co. and Lockheed-Martin, has 5,917 workers at the Cape. NASA managers oversee the work. ["Alliance may pay \$9 million more in shuttle overtime," **Florida Today**, March 16, 2001, p 1A & 3A.]

MARCH 17: Lightning storms are dangerous and unpredictable. That's why researchers at Kennedy Space Center are focusing on an array of instruments to detect and divert lightning. If the object is a rocket or a space shuttle, the cost of a strike could be enormous in equipment and, potentially, lives. There are several detection systems at KSC, from spherical electric-field sensors to the LDAR system, or lightning detection and ranging, which can map strikes in three dimensions. One of the newest detection systems is the sonic lightning locator. "It will allow you to tell exactly where lightning struck," said Pedro Medelius, senior scientist at Dynacs, which developed the system for NASA. The sonic lightning locators' range is about half a mile, so using them around launch pads is a perfect application. The two locators, in the lab until the storm season starts in earnest, are expected to be deployed permanently at the shuttle pads by year's end. ["New system boosts NASA's lightning-detection capability," **Florida Today**, March 18, 2001, p 1A & 3A.]

◆ NASA has extended its Galileo mission a third time, allowing the unmanned spacecraft to continue orbiting Jupiter until 2003, when it will make a fiery plunge in the planet's atmosphere. Galileo, launched in 1989, completed its primary exploration of the Jupiter system in 1997. ["NASA extends Galileo's mission," **Florida Today**, March 18, 2001, p 4A.]

MARCH 18: A U.S. Navy skipper relinquished command of the International Space Station to a Russian cosmonaut Sunday as astronauts aboard shuttle Discovery set out to ferry the outpost's vanguard crew back to Earth. In a ceremony steeped in naval tradition, outgoing station commander Bill Shepherd handed the ship's logs and the helm of space station Alpha to Yuri Usachev. With the first full-time tenants of the station in tow, shuttle Discovery was set to depart at 11:32 p.m. Sunday, circling the complex then heading on a two-day mission back to Earth. Discovery remains scheduled to land at Kennedy Space Center at 12:55 a.m. Wednesday (March 22). ["Cosmonaut takes reins of space station Alpha," **Florida Today**, March 19, 2001, p 1A.]

MARCH 19: The National Imagery and Mapping Agency (NIMA) has been quietly scanning Mars pictures, looking for the Mars Polar Lander since early December 1999. According to a source close to the NIMA effort, photographic specialists at NIMA think they've spotted something. But NASA officials say it's too early to tell. The Mars Polar Lander (MPL) dove into the Martian atmosphere on Dec. 3, 1999, heading for a soft landing on the planet's south polar region. But contact was never reestablished after the probe was to have touched down. [Web posted. (2001). Spy Agency May Have Located Mars Polar Lander [Online]. Available WWW: <http://www.space.com/>, [19 March 2001].]

◆ Two Russian cosmonauts Monday refused to train at NASA's Johnson Space Center unless American financier Dennis Tito is included in the sessions. Tito, who paid the Russian Space Agency \$20 million for the right to fly to space station Alpha on a Russian Soyuz rocket, was not allowed in crew training Monday because NASA said it had to discuss legal and other issues with him. The mission is to launch from the Baikonur Cosmodrome in Kazakhstan on April 30 and arrive at the station two days later. NASA said the outpost is too dangerous for space tourists. ["NASA refuses to allow Tito to train," **Florida Today**, March 20, 2001, p 2A.]

◆ NASA's 2001 Mars Odyssey spacecraft, set for launch April 7 on a Delta 2 launch vehicle, aims to find out what Earth's planetary neighbor is made of and evaluate radiation that could be risky to humans, space agency officials said Monday. The Odyssey, named in honor of the book and movie 2001: A Space Odyssey, is the first in a retooled exploration strategy for this planet after the 1999 losses of the Mars Climate Orbiter and the Mars Polar Lander. The main structure of the craft is about the size of a subcompact car, but its solar panels have a wingspan of about 19 feet. It weighs about 1,600 pounds and will travel 286 million miles to get to Mars, arriving in October. ["NASA tries Mars again," **Orlando Sentinel**, March 20, 2001, p A7.]

MARCH 20: Many Florida lawmakers appear hesitant to give more money to the Florida Spaceport Authority after spending \$4 million to house a next-generation space shuttle that was eventually scrapped by the federal government. House budget makers have set aside only \$2 million for the Space Experiment Research and Processing Laboratory at Kennedy Space Center, some \$14 million short of what the Florida Spaceport Authority sought for the project. Spaceport executive director Ed Gormel said its up to his agency to demonstrate to the Legislature the importance of projects like the lab. Lawmakers from the House and Senate will spend the next six weeks negotiating over budget items before agreeing on one proposal and sending it to the governor. ["House questions space lab funds," **Florida Today**, March 21, 2001, p 1A & 2A.]

◆ NASA does not want a tourist on its space station Alpha, but there is little the agency can do to stop it, officials conceded Tuesday. Michael Hawes, NASA's deputy associate administrator for the space station, said the station is too dangerous for untrained visitors such as American businessman Dennis Tito. Tito is scheduled to ride a Russian Soyuz rocket to Alpha along with two Russian cosmonauts on a 10-day mission to replace the outpost's escape capsule. He will pay the Russian Space Agency \$20 million for the trip, making him the first space tourist. ["NASA, Russia at odds over space tourist," **Florida Today**, March 21, 2001, p 3A.]

MARCH 21: Space Shuttle Discovery landed at the KSC Shuttle Landing Facility Wednesday, March 21, on runway 15. Main gear touchdown occurred at 2:31:42 a.m. EST, nose wheel touchdown at 2:31:54 a.m., and wheel stop at 2:33:06 a.m. The landing on orbit 201 concluded mission STS-102, the eighth flight to the International Space Station. The 12-day, 19-hour, 51-minute mission returned both the Leonardo and the first resident crew of the ISS, Expedition One to KSC. Discovery logged 5.3 million miles on this mission. The landing marked the 54th at KSC in the history of the program, and the 12th night landing at KSC. ["Discovery ends successful mission with landing at KSC," **KSC Countdown**, March 22, 2001.]

◆ Astronaut Bill Shepherd and Russian cosmonauts Yuri Gidzenko and Sergei Krikalev returned to Kennedy Space Center onboard shuttle Discovery at 2:31 a.m. Wednesday. Low clouds and high winds kept weather watchers' attention as Discovery prepared to return. "I really didn't expect to be here," Discovery commander Jim Wetherbee told reporters soon after landing. "I expected to be in California or still in space." Wetherbee and astronauts Jim Kelly, Andy Thomas and Paul Richards were a taxi crew of sorts, overseeing the first crew rotation on the station. ["Alpha's 1st crew returns to Earth," **Florida Today**, March 22, 2001, p 1A.]

MARCH 22: After 15 years in the heavens, space station Mir started its return late Thursday, its cargo-ship engines putting the space station on course for a fiery plunge into the South Pacific. The station was expected to crash into the sea about 1:30 a.m. ["Mir falls toward Earth," **Florida Today**, March 23, 2001, p 1A.]

◆ As an embezzlement investigation continues at Spaceport Florida Authority, some lawmakers are thinking twice about giving the public-private group more state money for other projects. So far, state funding of a space research lab at Kennedy Space Center appears to be safe. Many legislators, as well as the governor, consider the planned \$47 million Space Experimental Research Laboratory a key to recruiting and boosting space-related business in Florida. Agency officials confirmed Wednesday that an investigation is under way into possible theft by an employee, who was placed on leave this week. They haven't said how much money they suspect is missing and added they could not comment further. The timing of the investigation couldn't be worse: Legislators in the House and Senate will put final touches on their budget proposals next week. Lawmakers already are guarded when it comes to giving more money to the agency, after spending \$4 million for a hangar for the scrapped X-33, a prototype for the next shuttle. The agency requested money from the Legislature for marketing, operations, next-generation launch systems and other programs for the fiscal year that begins July 1. The \$47 million Space Experimental Research and Processing Laboratory would analyze data brought back from space station Alpha. NASA would operate the facility in a partnership with the Florida Space Research Institute and a coalition of state universities. ["Legislators question Spaceport funding," **Florida Today**, March 23, 2001, p 1A & 2A.]

◆ NASA moved shuttle Endeavour to Launch Pad 39A on Thursday, in preparation for next month's shuttle mission. Endeavour is set to begin another mission to space station Alpha at 3:12 p.m. April 19. The shuttle and its international seven-member crew will bring a new robotic arm to the station, as well as more supplies for the Destiny Lab. The 55-foot arm, made by Canada, will be bigger and have greater dexterity than the shuttle robot arm that goes on every mission. The station arm is necessary for future construction on the outpost. The arm is sturdy enough to maneuver an entire shuttle. This 11-day mission will include astronauts from the United States, Russia, the European Space Agency and the Canadian Space Agency. ["Endeavour put on pad for next mission," **Florida Today**, March 23, 2001, p 3A.]

MARCH 23: After losing its primary tenant, the landlords of a vacant \$4 million hangar built with state money will have new occupants after all. Under a two-year lease agreement, Spaceport Florida Authority will rent the hangar to United Space Alliance (USA), said Pam Dana, director of the governor's Office of Tourism, Trade and Economic Development, which oversees public-private space industry activities. USA, which operates space shuttle launches and activities for NASA at Kennedy Space Center, would use the 50,000-square-foot hangar as a storage facility for ground support equipment, such as orbiter lifting devices, USA spokesman Jack King said. The hangar, next to the KSC shuttle landing strip, originally was built to store the X-33, the prototype for the next-generation space shuttle. The federal government has since scrapped the project because of technical difficulties and other concerns. ["Space alliance to lease vacant \$4 million hangar," **Florida Today**, March 24, 2001, p 1A & 2A.]

◆ The Russian space station, Mir, fell from orbit in the South Pacific with flawless precision. Chunks of the 135-ton station that survived the plunge through Earth's atmosphere produced a spectacular show of giant white fireballs. ["Mir team pulls off a flawless final act," **Orlando Sentinel**, March 24, 2001, p A9.]

MARCH 24: The first Delta 4 rocket, built by Boeing, is expected to launch from Cape Canaveral Air Force Station's Launch Pad 37 early next year. Down the road at Launch Pad 41, Lockheed Martin hopes to do the same with its new Atlas 5, also scheduled to launch in 2002. They are part of the next generation of U.S. rocketry, promising the capability to carry payloads to orbit at lower costs. With them rests the Cape's future in the expendable launch business, which is rife with international competitors. Delta 4 is the next step in a program that began as

the Thor missile and started launch satellites Aug. 12, 1960. The line has almost 300 launches under its belt. Atlas 5 is the latest incarnation of a rocket that began as a missile and eventually carried John Glenn into orbit in 1962. The family has more than 550 launches to its credit. Both pads and launch facilities are more than half-finished. The Atlas 5 is scheduled for launch in May 2002, and the Delta 4 is on track for launch in April of that year. ["Latest in launch pads coming to Space Coast," **Florida Today**, March 25, 2001, p 1A & 3A.]

MARCH 27: The Mars Odyssey Orbiter was transferred from the Space Assembly and Encapsulation Facility 2 on March 27 to Launch Complex 17 at Cape Canaveral Air Force Station. There it will be mated to a Boeing Delta II rocket for launch scheduled Saturday, April 7, at 11:02 a.m. The orbiter will map the Martian surface in search of geological features that could indicate the presence of water, now or in the past, and may contribute toward understanding what will be necessary for further exploration of Mars. ["Mars Odyssey to be mated to Delta rocket for launch April 7 from CCAFS," **KSC Countdown**, March 27, 2001.]

MARCH 28: The STS-100 crew arrived at the Shuttle Landing Facility for Terminal Countdown Demonstration Test activities. The seven-member international crew comprises Commander Kent Rominger, Pilot Jeff Ashby and Mission Specialists Chris Hadfield, Scott Parazynski, John Phillips, Umberto Guidoni and Yuri Lonchakov. Hadfield is with the Canadian Space Agency, Guidoni the European Space Agency and Lonchakov the Russian Aviation and Space Agency. TCDT includes training on emergency escape procedures and a simulated launch countdown. The STS-100 mission is scheduled to launch April 19 at 2:41 p.m. EDT from Launch Pad 39A. ["STS-100 crew arrives for TCDT," **KSC Countdown**, March 29, 2001.]

◆ United Space Alliance improperly charged NASA up to \$468,673 for outside consultants the company hired in 1998 and 1999, according to a NASA Inspector General audit report released Wednesday. The report details instances where work was poorly described and detailed, invoices were incomplete, and USA had poor justification for issuing contracts. The audit results follow USA's acknowledgment recently that it anticipated spending up to \$9 million more than it planned for overtime this fiscal year. In the 45-page report, the inspector general said services charged to NASA did not meet Federal Acquisition Regulation requirements. NASA concurred with the findings of the audit. ["NASA questions contractor's billing," **Florida Today**, March 29, 2001, p 1A & 2A.]

DURING MARCH: A second NASA advisory panel, this one headed by former Lockheed Martin Executive Vice President Thomas Young, has urged NASA to recognize that the space shuttle fleet probably will fly well after its current 2012 retirement date and should be upgraded accordingly for safety even if it costs more than the \$1.6 billion currently budgeted for shuttle upgrades. The Space Flight Advisory Committee (SFAC) of the NASA Advisory Council echoed the Aerospace Safety Advisory Panel (ASAP) in urging NASA to consider a new crew escape capability and propulsion upgrades including liquid-fueled boosters. The ASAP reported its findings last month, before NASA terminated the X-33 prototype for a space shuttle replacement. ["Second Independent Panel Calls For More Space Shuttle Upgrades," **Aviation Week & Space Technology**, March 19, 2001, p 40.]

APRIL 2001

APRIL 1: The Hubble Space Telescope will be shuttle Columbia's first stop in space following an extensive and troublesome overhaul. Columbia, the oldest of NASA's shuttle fleet, is to take flight Nov. 19, its first mission since July 1999. The shuttle was supposed to make two flights in 2001. But because Columbia stayed so long at Boeing's Palmdale, Calif., factory, technicians have only enough time to prepare the orbiter for one flight this year. For the space telescope, launched in 1990, it will be the fourth visit from astronauts. Missions in 1993, 1997 and 1999 repaired flaws in the 2.4-meter mirror and upgraded older parts. Repair missions to the orbiting telescope are planned about every two years. ["Columbia to fly repair mission to Hubble," Florida Today, April 2, 2001, p 1A.]

APRIL 3: NASA put the applications of astronaut hopefuls on hold for the first time in 13 years, the agency said Tuesday. An abundance of astronauts has something to do with the decision — almost half of those available to fly have never been in space. NASA spokeswoman Eileen Hawley said the Astronaut Selection Office in Houston delayed the selections indefinitely. ["NASA puts freeze on astronaut applicants," Florida Today, April 4, 2001, p 2A.]

◆ An experimental unmanned spaceplane will call the Cape Canaveral Spaceport home in 2003 under an agreement reached between Boeing and the Florida Spaceport Authority. The new spaceship is the X-37, a bullet-bodied 6-ton craft with stubby wings and a small cargo bay. NASA, Boeing and the Air Force have been developing the \$200 million craft since 1999. Marshall Spaceflight Center in Huntsville, Ala., manages the program. The prototype would move to Cape Canaveral's Launch Complex 20 in 2003 for engine tests and final preparations. It is to be launched atop either an expendable rocket or the space shuttle in 2004. ["X-37 to make Cape Canaveral home," Florida Today, April 4, 2001, p 2A.]

APRIL 5: NASA managers stuck with their initial schedule and established 2:41 p.m. April 19 as shuttle Endeavour's official launch time Thursday. NASA had considered moving the mission to space station Alpha back a day or ahead into May because of an upcoming Russian Soyuz flight. American millionaire Dennis Tito and two Russian cosmonauts are expected to launch aboard a Soyuz rocket from Kazakhstan on April 28, the same day Endeavour leaves the station. Should Endeavour's launch be delayed because of weather or technical concerns, the Russian Space Agency has agreed to delay the Soyuz launch, said Bruce Buckingham, Kennedy Space Center spokesman. ["NASA keeps launch date for shuttle," Florida Today, April 6, 2001, p 2A.]

APRIL 7: Roy Bridges, director of the Kennedy Space Center, has received the 2001 Dr. Kurt H. Debus Award from the Florida Committee of the National Space Club in recognition of his "progressive, visionary leadership and contributions to space technology and exploration." The award honors achievements and contributions made in Florida to the U.S. aerospace effort and is named for the first KSC director. ["Honors and Elections," Aviation Week & Space Technology, April 30, 2001, p 14.]

◆ NASA's Mars Odyssey began its 286-million mile journey with a perfect launch Saturday morning, relieving many in the space agency who have longed for redemption since two Mars-bound missions were lost in 1999. The failures grounded the agency's ambitious Mars plan while review boards scoured records and data for reasons. A rover slated to fly to Mars along side Odyssey was axed, leaving Odyssey to make the trip solo. At 11:02 a.m., the spacecraft lifted off smoothly from Cape Canaveral Air Station aboard a Boeing Delta 2 rocket. Less than an hour

later, ground controllers received signals showing the spacecraft was healthy and on its way to the Red Planet. ["Odyssey off to Mars," **Florida Today**, April 8, 2001, p 1A & 5A.]

APRIL 8: The crew of STS-100 returned to KSC Sunday, April 8, to complete Terminal Countdown Demonstration Test activities that were postponed due to heavy winds and rains the week of March 26. They practiced driving M-113 tanks; had slidewire basket and fire training, and White Room familiarization; and did payload bay walk-down. The crew – commander Kent Rominger, Pilot Jeff Ashby, and Missions Specialists Chris Hadfield, Scott Parazynski, John Phillips, Umberto Guidoni and Yuri Lonchakov – is scheduled to return to KSC April 16 to prepare for launch on April 19. ["STS-100 crew completes TCDT, ready for launch April 19," **KSC Countdown**, April 10, 2001.]

APRIL 9: President Bush laid out a \$14.5 billion NASA budget that includes a decrease in space station funding, and increases for shuttle upgrades and robotic Mars exploration. Kennedy Space Center would see its budget bumped up \$77 million to just under \$1 billion. Johnson Space Center would still command the largest budget, almost \$4.5 billion next year. Bush's Office of Management and Budget released the figures Monday when it unveiled the nation's \$1.96 trillion spending plan. ["Bush unveils NASA budget," **Florida Today**, April 10, 2001, p 1A & 3A.]

◆ NASA space station managers said Monday they would have preferred millionaire Dennis Tito fly to space station Alpha in October rather than April. Tito paid the Russians to fly on space station Mir before it splashed into the Pacific. The Russians are trying to honor his contract by sending him to Alpha on a Soyuz capsule April 28. NASA and some of its international partners opposed Tito's April trip, saying he lacks the training on the American elements and protocol. He has spent several months training in Russia. The Russians maintain that Tito will fly this month. ["NASA, Russia continue Tito discussions," **Florida Today**, April 10, 2001, p 1A.]

APRIL 12: Twenty years ago today on April 12, 1981, the first space shuttle was launched from Kennedy Space Center with John Young and Robert Crippen at the controls. When shuttle Columbia rocketed into space for the first time many thought the shuttle program would end by the time it reached its 20th anniversary. NASA has no tangible plans to replace the shuttle for at least another 15 years. ["Aging orbiter fleet has plenty of life left," **Florida Today**, April 12, 2001, p 1B & 4B.]

◆ Forty years ago today on April 12, 1961, the Soviet Union launched the first cosmonaut, Yuri Gagarin into space for a 108 minute ride. ["Gagarin's flight set foundation for Alpha," **Florida Today**, April 11, 2001, p 1A & 3A.]

APRIL 13: NASA's defunct X-33 prototype may be a precursor to a military space force – if the Air Force can make it work. Lockheed Martin, Air Force and NASA officials are discussing a plan that would revive the X-33 – formerly a prototype to replace the space shuttle – until at least October, officials said Friday. That would give the Air Force enough time to decide whether to pick up the project, which has cost NASA and Lockheed Martin \$1.3 billion to date. The unmanned X-33 could lead to a fleet of reusable spacecraft to launch new satellites on short notice, or destroy enemy satellites in orbit. It would cost \$14 million to \$15 million to continue work on the project. Neither NASA nor the Air Force included the project in their budgets. ["Work may resume on X-33," **Florida Today**, April 14, 2001, p 1A & 2A.]

APRIL 16: The STS-100 crew arrived at KSC the morning of April 16. The countdown on mission STS-100 began April 16 at 6 p.m. EDT at the T-43 hour mark. This mission marks the

9th Shuttle flight to the International Space Station and the 3rd Shuttle mission this year. The KSC launch team will conduct the countdown from Firing Room 3 of the Launch Control Center. Mission STS-100 is the 16th flight of the orbiter Endeavour and the 104th flight overall in NASA's Space Shuttle program. STS-100 is scheduled to last 10 days, 19 hours and 19 minutes with a planned KSC landing at about 10 a.m. on April 30. ["Countdown for mission STS-100 began 6 p.m. April 16," **KSC Countdown**, April 17, 2001.]

APRIL 18: Delaware North Parks Services of Spaceport, Inc., has established an A/B Honor Roll program at the Kennedy Space Center Visitor Complex. The program recognizes elementary school students who achieve excellence in their academic endeavors. The program offers students who achieve A/B Honor Roll status a certificate of honor as well as a coupon for one free youth admission to the Kennedy Space Center Complex. The program is offered to elementary school students in Brevard, Indian River, Orange, Osceola, Seminole, and Volusia counties. ["KSC Offers Incentives For Good Grades," **Space Coast Press**, April 19, 2001.]

◆ NASA's Kodiak Star mission is planned to launch on a Lockheed Martin Athena I rocket on August 31 from Alaska's Kodiak Launch Complex (KLC) and will have four satellites on board. Three are USAF sponsored satellites; PICOSAT, PCSAT and Sapphire. The primary satellite is NASA's spacecraft Starshine 3. This satellite is nearly a meter in diameter (37 inches), weighs 91 kilograms (200 pounds) and will carry more than 1,000 aluminum mirrors which were hand ground and polished by participating grade school students from around the world. One participating fourth grade class at Tropical Elementary on Merritt Island processed two aluminum blanks. Each aluminum blank is approximately one inch in diameter. ["Tropical Students Have Mirrors On Kodiak Mission," **Space Coast Press**, April 19, 2001.]

APRIL 19: Right on time, space shuttle Endeavour outshone the afternoon sun as it surged through the sky with more than 20,000 pairs of eyes watching. Aving the large crowd of international guests, Endeavour began its 11-day mission to space station Alpha at 2:40 p.m., after a relatively uneventful countdown. It carries a robotic arm, a cargo module and seven men. The only glitch in the countdown was an error when the crew hatch was closed. But workers re-tested the door and found it to be sealed. The shuttle program's 104th mission is the most international spaceflight ever, with space-flying representatives of four countries. It drew 20,370 visitors and 1,125 members of the press from Canada, Europe, Russia and the United States. The shuttle orbiter is scheduled to land at 10 a.m. April 30 at KSC. ["Endeavour, robot arm zoom toward station," **Florida Today**, April 20, 2001, p 1A & 3A.]

◆ Italy will build a living quarters segment for space station Alpha under an agreement signed hours before Endeavour lifted off to the outpost Thursday. The segment, called a habitation module, would hold four people, giving the station enough room and equipment to support seven crew members for months at a time. The agreement marks the beginning of formal negotiations between NASA and the Italian Space Agency. NASA Administrator Dan Goldin said the deal could be finalized in six months. ["Italy to construct station living quarters," **Florida Today**, April 20, 2001, p 1A.]

◆ An economic-development program sponsored by NASA is being expanded to four states and will include more government financing. The Space Alliance Technology Outreach Program allows private businesses to use the expertise of people involved in the space program to fix problems with an operation or system. The free help comes from experts at NASA, area universities and aerospace companies. U.S. Rep. Dave Weldon, R-Palm Bay, announced the program's expansion Thursday to about 150 Florida economic-development officials, who were at the Kennedy Space Center to watch the launch of the shuttle Endeavour. The program will

receive \$6 million from NASA over the next two years. Businesses in Florida, New Mexico, New York and Texas are eligible. ["NASA's economic program expands," **Florida Today**, April 20, 2001, p 1C.]

APRIL 20: As NASA reaches for futuristic new horizons at Kennedy Space Center, the agency still must cope with a more old-fashioned problem – balancing the negative effects of development on the surrounding marshes and wetlands. The agency recently announced plans to give back to the environment – before it even begins any new development. The proposed mitigation program would restore miles of mosquito impoundments and freshwater areas in the Kennedy Space Center, from southern Mosquito Lagoon to the Banana River. The project also includes restoring two dragline-ditched islands in Volusia County. A total of 6,196 acres of marshes and wetlands would benefit, including 624 acres in Mosquito Lagoon, said John Schaffer, a physical scientist in NASA's environmental program office. The project would be paid for by NASA and implemented by staff at the Merritt Island National Wildlife Refuge. ["NASA plans to restore wetlands," **News Journal**, April 21, 2001.]

APRIL 23: Former astronaut David Walker, who made four space shuttle flights, including the 1989 flight that launched a probe that mapped the surface of Venus, died Monday of cancer. Walker, 56, was among the first group of space shuttle astronauts chosen by NASA in 1978. He flew as a pilot aboard space shuttle Discovery in 1984 and went out to command three space shuttle missions in 1989, 1992, 1995. ["Former astronaut dies," **Florida Today**, April 24, 2001, p 2A.]

◆ California showers are on the minds of Florida technicians waiting for shuttle Atlantis to dry out. The orbiter detoured to Edwards Air Force Base, Calif., Feb. 20 to end its mission to International Space Station Alpha. Persistent rain showers kept Atlantis on the West Coast for more than a week, all the while soaking up the dampness. The shuttle was moved into a commercial aircraft hangar during the worst storms, NASA spokesman Bruce Buckingham said. Launch Director Mike Leinbach said recently the fragile heat shield tiles and thermal blankets on Atlantis absorbed the moisture. They can't be vacuumed or blown dry, so KSC's technicians have to wait for the moisture to evaporate as the shuttle goes through its months-long preparations for flight. Atlantis is scheduled to launch June 14 on another mission to Alpha. ["Technicians wait for Atlantis to dry out," **Florida Today**, April 24, 2001, p 2A.]

◆ The oldest structure at the Cape Canaveral Air Force Station is the Canaveral Lighthouse. The National Register of Historic Places is expected to include the lighthouse in its listing of landmarks sometime this year, said Clay Gordin, chief of environmental planning and conservation at Cape Canaveral. The listing will ensure the 133-year-old lighthouse is properly maintained and protected. The U.S. Coast Guard operates the lighthouse, which automatically turns on at dusk and off at dawn. ["Landmark list expects to add old lighthouse," **Florida Today**, April 24, 2001, p 3A.]

APRIL 24: Unable to stop Russia from flying a wealthy U.S. businessman to the International Space Station, NASA will direct astronauts aboard the vessel to slow their busy work schedule next week to keep an eye on the uninvited guest. Instead of checking out the new billion-dollar robot arm and performing other duties, U.S. astronauts Susan Helms and Jim Voss will focus their attention on California businessman Dennis Tito, who paid Russia \$20 million for a six-day holiday to the incomplete outpost. The U.S. will not share in Tito's fee. NASA officials opposed the trip because Tito is an untrained civilian and could pose a danger to himself, the crew and the space station. ["Station crew forced to keep tabs on Tito," **Florida Today**, April 25, 2001, p 1A & 3A.]

◆ Fifteen years after their deaths aboard space shuttle Challenger, Greg Jarvis and Christa McAuliffe have officially become astronauts. U.S. Rep. Sherwood Boehlert, R-N.Y., is chairman of the House Science Committee that oversees NASA. His district includes an area of New York where Jarvis grew up. Boehlert met with NASA Administrator Goldin in February and a month later Goldin wrote Boehlert that payload specialists would henceforth be known as payload-specialist astronauts. Their biographical information will be grouped with career astronauts. NASA web sites are being updated to reflect the changes. [“Challenger ‘specialists’ are at last astronauts,” **Orlando Sentinel**, April 25, 2001, p A1 & A6.]

APRIL 26: Atlantis, the next orbiter to be launched (STS-104), is in OPF bay 3. Activity this week included installing Space Shuttle main engines. Currently rollover to the VAB is slated for mid-May. Discovery, getting prepared for mission STS-105, is in OPF bay 2. Routine orbiter inspections are on schedule. Columbia is in OPF bay 1. The orbiter is undergoing post-maintenance power-up. Columbia’s first mission since returning from California for upgrades and maintenance will be a Hubble Servicing Mission, STS-109. [“Atlantis to fly in June; Discovery, Columbia in line for flights later this year,” **KSC Countdown**, April 26, 2001.]

◆ Endeavour’s departure from space station Alpha has been delayed by at least a day because of a string of unexplained computer problems. Undocking could be delayed another day, but that depends on negotiations with the Russians, who were planning a launch. Two extra days at the station could delay the launch of a Soyuz rocket from Kazakhstan on Saturday. The Soyuz capsule will carry cosmonauts Taldat Musabayev and Yuri Baturin and American space tourist Dennis Tito. Endeavour and the Soyuz capsule cannot be at the station at the same time because Endeavour’s tail comes very close to the Soyuz flight path to the station. [“Shuttle, Tito delayed by station glitches,” **Florida Today**, April 27, 2001, p 1A.]

APRIL 27: New research led by Misha Kreslavsky, a space scientist in the department of geological sciences at Brown University in Providence, Rhode Island, has found anomalies in the moon’s surface in the vicinity of the Apollo 15 landing site. Kreslavsky, along with research colleague Yuri Shkuratov of the Kharkov Astronomical Observatory in the Ukraine, made use of images taken by the U.S. Defense Department’s high-tech Clementine lunar orbiter which circled the moon in 1994. Their work was dedicated to help discern fresh impacts on the moon, or to search for sites of recent seismic activity in the lunar crust. A small dark spot found in the Clementine images is not associated with the any fresh crater, but exactly coincides with the Apollo 15 landing site. [Web posted. (2001). [Apollo 15 Landing Site Spotted in Images [Online]. Available WWW: <http://www.space.com/> [2001, April 27].]

◆ Russian officials Friday resisted a U.S. request for an extra day and insisted they will launch a rocket on schedule carrying California businessman Dennis Tito, the world’s first paying space tourist. The request from NASA was the latest conflict between Russia and the United States over Tito’s trip to the International Space Station. NASA had objected to allowing an amateur aboard the space station but dropped its complaints this week. Then NASA asked Russia to postpone the launch to allow the shuttle Endeavour to stay longer at the station. Computer problems were forcing astronauts to put off operations of a critical robot arm. Keeping the shuttle at the station could make docking the Russian spacecraft extremely delicate and potentially dangerous. Later Friday, NASA said Russian space officials agreed to put the Soyuz in a holding pattern if the shuttle was still at the outpost Monday. NASA said the shuttle could leave Sunday, but only if the computer trouble was resolved quickly. [“American space tourist set to lift off from Russia,” **Florida Today**, April 28, 2001, p 1A & 2A.]

APRIL 28: The world's busiest and most sophisticated spaceport cannot assume rocket builders and NASA will flock to it as launch technology evolves. That's why Spaceport Florida Authority officials have teamed with Kennedy Space Center and the Air Force's 45th Space Wing to develop a 50-year master plan for development. Orlando-based ZHA Inc., which laid out the acclaimed master plan for the Greater Orlando Aviation Authority, was hired as a consultant. The plans are to be discussed during the 38th Space Congress at the Radisson Resort at the Port. ["Spaceport develops 50-year master plan," **Florida Today**, April 29, 2001, p 1C & 4C.]

APRIL 29: NASA scientists said Sunday they have contacted the Pioneer 10 spacecraft, ending fears that the robotic probe had gone silent 29 years into a mission that has carried it more than 7 billion miles from Earth. A radio antenna outside Madrid received a signal from Pioneer 10 on Saturday, marking the first time the spacecraft had been heard from since Aug. 19. The spacecraft was launched March 2, 1972. ["After 8 months, NASA hears from Pioneer 10," **Florida Today**, April 30, 2001, p 2A.]

MAY 2001

MAY 1: Shuttle Endeavour's wheels touched down safely at Edwards Air Force Base, Calif., on Tuesday after a busy 12-day mission to space station Alpha. Endeavour was scheduled for a 9:04 a.m. landing attempt at Kennedy Space Center, but bad weather prevented that. Forecasters predicted unacceptable conditions for landing in Florida all week. So instead of keeping Endeavour circling Earth trying to wait out the weather, shuttle managers decided to bring it down in California. Endeavour landed in near perfect conditions at 12:11 p.m. at an estimated 225 mph. NASA has landed three of the last five shuttle missions in California's Mojave Desert. Managers hope to have Endeavour back at KSC as early as Saturday (May 5) evening. ["Endeavour lands in California," **Florida Today**, May 2, 2001, p 1A.]

MAY 2: Brevard County's space industry is having a stellar year. From a research facility that's in line for \$16 million to \$2.6 million in sales taxes that will be directed back into the industry, space-related projects and businesses are doing well with state lawmakers. The biggest plum is the \$16 million earmarked for the Space Experiment Research and Processing Laboratory. Local lawmakers are even more excited about a bill approved by the House earlier this week. The proposal (HB 1111) would take the sales tax generated by the commercial businesses at the Kennedy Space Center and hand it over to the Florida Commercial Space Financing Corporation, an economic development group created by the 1999 Legislature. The money would be used to match private funds for space-related projects, including research, software and such essentials as new launch pads. The bill has not yet been heard in the Senate. ["Budget boosts space industry," **Orlando Sentinel**, May 3, 2001, p D5.]

MAY 3: Specialists at Kennedy Space Center have found a way to convert rocket waste into fertilizer. The process, which turns a costly disposal problem into a potentially profitable product, was good enough to win its developers a Commercial Invention of the Year Award. "It's the first time KSC has won the award, which every year recognizes a significant technology spin-off developed at one of NASA's centers," KSC Director Roy Bridges said. Set to receive the award at NASA Headquarters in Washington, D.C., are Paul Gamble, Dynacs Engineering Corp., Clyde Parrish, who is credited with the concept behind the project, and NASA researchers Dale Lueck and Andrew Kelly. Parrish was with Dynacs and now is with NASA. According to KSC commercialization manager Pam Bookman, the Air Force has expressed interest in the technology for launch facilities at Cape Canaveral and Vandenberg Air Force Base in California. ["Rocket fuel becomes fertilizer," **Florida Today**, May 4, 2001, p 1C.]

◆ A handful of men and women protested the military's renewed interest in space with pickets during the last sessions of the Space Congress. Organized by the Gainesville-based Global Network Against Weapons & Nuclear Power in Space, the protest was hampered by intermittent rain showers. ["Group protests at Cape over military in space," **Florida Today**, May 4, 2001, p 8A.]

◆ Russian officials denied Thursday that space tourist Dennis Tito had disrupted work on the International Space Station, saying he was spending his time making videos and staying out of the way. Tito, 60, an investment banker from Santa Monica, Calif., arrived at the station Monday on a Russian Soyuz spaceship together with two cosmonauts. He reportedly paid up to \$20 million for the trip, which NASA opposed and said would disrupt work on board. ["Russia: Tito not in the way," **Florida Today**, May 4, 2001, p 8A.]

MAY 5: Astronaut Alan Shepard became the first American in space when he took a 15-minute flight inside a Freedom 7 Mercury spacecraft mated atop a Redstone rocket 40 years ago today on May 5, 1961. [“Shepard made history as first American in space 40 years ago,” **Florida Today**, May 5, 2001, p 1A & 2A.]

◆ Up to 3,700 travel-industry representatives from around the United States and the world are expected to attend a reception at Kennedy Space Center. The event will start the Travel Industry Association of America’s International conference, an annual tourism and travel trade show today through Wednesday in Orlando. In Brevard County, the tourism industry has an economic impact of more than \$600 million a year, and employs about 20,000 people, according to local studies. [“Travel industry reps will visit KSC,” **Florida Today**, May 5, 2001, p 1C.]

◆ Florida lawmakers took advantage of new technology this year to upgrade voting systems, pay for more space-related programs and even deliver a \$48 billion budget agreement via electronic mail. The budget contains about \$19 million to expand space-related programs at Kennedy Space Center. Of that, \$16 million will boost the development of a space research lab that will analyze data brought home from the International Space Station. Local lawmakers had trouble passing a bill that would have increased space-related business development with sales tax revenue from admissions and merchandise sold at KSC. But they slipped a last-minute amendment into a 200-page transportation bill that sets aside \$1.3 million for aerospace infrastructure – in addition to \$3.1 million already in the state budget. [“Voting systems, space programs get boost,” **Florida Today**, May 6, 2001, p 1A & 8A.]

MAY 6: Dennis Tito, the world’s first space tourist, returned to earth aboard a Russian Soyuz capsule. The capsule touched down at 12:41 a.m. and was dragged about 50 feet across the Kazakh steppe as a strong side wind caught its parachute. [“Giddy Tito returns to Earth,” **Florida Today**, May 7, 2001, p 1A.]

MAY 8: Weather permitting, Endeavour is expected to return to KSC Wednesday, May 9, on a piggyback flight from Edwards AFB, Calif., stopping overnight at Dyess AFB in Abilene, Texas. Endeavour is next scheduled to fly Nov. 29 on mission STS-108, the 12th construction flight to the International Space Station, carrying the resident crew Expedition 4 and returning Expedition 3 to Earth. [“Return to Endeavour to KSC expected on Wednesday, May 9,” **KSC Countdown**, May 8, 2001.]

MAY 9: After an overnight detour to Arkansas, shuttle Endeavour returned from its week in the west. Taking a ride on top of NASA’s modified Boeing 747 jet, the shuttle left Edwards Air Force Base, Calif., on Tuesday. It made a stop at Altus Air Force Base, Okla., and spent the night in Little Rock. Endeavour concluded its 12-day mission to space station Alpha last Tuesday at Edwards because of bad weather at Kennedy Space Center. It costs NASA about \$1 million to fly the shuttle orbiter back to Florida. The aircraft touched down at KSC at 2:09 p.m. after making a pass over Orlando and Brevard’s northern beaches. [“Endeavour rides piggyback to KSC,” **Florida Today**, May 10, 2001, p 1B.]

◆ The addition of two ejection seats and a capsule in the cargo bay may allow a crew of astronauts to escape a crippled shuttle in a launch or landing emergency, a NASA study has concluded. The commander and pilot, sitting in the orbiter’s cockpit, would sit in ejection seats similar to those on military aircraft. The remaining crew, usually five, would ride in a pod inside the cargo bay. The pod would be equipped with rockets of its own. In an emergency, the pod would shoot out of the cargo bay and drift to the ocean on a parachute. Art Stephenson, director of Marshall Space Flight Center in Huntsville, Ala., said the ejection seat, cargo bay capsule

method may be the only way to efficiently modify the shuttle. ["Ejection seat may save crew, NASA says," **Florida Today**, May 10, 2001, p 1A.]

MAY 10: NASA has postponed a few upcoming shuttle launches, but the next liftoff is still planned for June 14. Shuttle Columbia's first mission since its extensive overhaul has been pushed back from Nov. 19 to Jan. 17, 2002. That mission will add more capabilities to the Hubble Space Telescope, officials said. Columbia returned late from the Boeing plant in Palmdale, Calif., in March, cutting into the time it takes to get it ready for launch, NASA spokesman Joel Wells said. Because of that delay, Columbia's following flight devoted to research was moved from April to May 2002. Shuttle Endeavour also was delayed last week. Its next liftoff will be on Nov. 29, a slip of 28 days. However, the next launch of shuttle Atlantis is still on target. ["Delays push back shuttle launch dates," **Florida Today**, May 11, 2001, p 1B.]

MAY 12: Roy D. Bridges, Jr., Director of NASA's John F. Kennedy Space Center, was awarded an honorary doctorate of engineering degree from Purdue University during commencement exercises on May 12 at West Lafayette, Ind. Bridges, a 1966 graduate of Purdue, was named KSC Director in March 1977. ["KSC Director Bridges receives honorary doctorate," **Brevard Technical Journal**, June 2001, p 5.]

MAY 15: A ceremonial Open House was held at Hangar AE, CCAFS, to recognize the upgraded Launch Vehicle Data Center. Participates included: Center Director Roy Bridges, Program Manager Stephen Francois, Expendable Vehicles and Payload Carriers, and Director Michael Benik, Expendable Vehicle Launch Services. ["Launch Vehicle Data Center at CCAFS being dedicated May 15," **KSC Countdown**, May 15, 2001.]

◆ A small rocket has raised concerns for NASA engineers trying to find out why it did not burn all its fuel during Endeavour's April launch. The rocket was one of four in the nose cone of the right solid-fueled booster. Together with four similar rockets on the rear of the 150-foot-long booster, they steer the booster away from the external tank and orbiter two minutes after liftoff. Attention is focused on a 32-inch-long, 12-inch-diameter rocket that left 4 to 5 pounds of its 75 pounds of fuel unburned, said Solid Rocket Booster Chief Engineer John Chapman of Marshall Space Flight Center in Huntsville, Ala. It was the first time such a rocket has returned with unused fuel, though the engine showed no signs of problems during launch. While the analysis is under way, Chapman said the chief suspect is water seeping into the rocket casing, possibly from rain while Endeavour was on the pad. The issue will be discussed during a series of management meetings leading up to Atlantis' June 14 launch, but is not expected to delay it. ["Space shuttle booster rocket under scrutiny," **Florida Today**, May 16, 2001, p 1A.]

◆ NASA is getting ready to unveil the latest contestants in the race to build a better shuttle. NASA is expected to announce contracts this week for a new generation of engines, crew escape systems and a host of other designs that can be assembled into a spacecraft. With the failure of the \$1.3 billion X-33 still lingering, NASA hopes to spend the next five years and \$4.5 billion designing two spacecraft to replace the venerable space shuttle fleet. The pair of competing designs will be taken to the industry to decide which to build. NASA hopes to have a new fleet of spacecraft operating by 2015. ["NASA to announce spacecraft contracts," **Florida Today**, May 16, 2001, p 1B & 2B.]

MAY 16: Shuttles could serve as temporary additions to space station Alpha, allowing a team of scientists to work in the outpost without further straining NASA's thin budget. The idea is one of several that space station managers are considering to compensate for a \$4 billion cost overrun on Alpha. A shuttle docked long-term could create room for a combined station-shuttle crew of

10. Five or six astronauts would be available to run experiments, compared to the one available under a revised U.S. plan. It takes at least two crew members just to keep the station operating day-to-day. Two more would keep the shuttle running. NASA considered adapting the shuttle fleet for 30-day missions about 10 years ago to allow it to host longer science missions. That was shelved when it appeared the station was becoming a reality, making the shuttle modification unnecessary. Now, the idea might be revived as a stopgap to allow research on the station without waiting for a new living quarters segment to arrive. ["Shuttle could serve as Alpha module," **Florida Today**, May 17, 2001, p 1A & 3A.]

◆ Today's planned launch of a Delta 2 rocket from Launch Pad 17B with a National Reconnaissance Office Satellite has been delayed to 1:07 p.m. Friday. Boeing's launch team requested the delay Wednesday to replace and test three flexible fuel and liquid oxygen hose on the rocket's first stage engine. ["Delta 2 launch delayed by day," **Florida Today**, May 17, 2001, p 3A.]

MAY 17: NASA tapped 22 companies Thursday for a five-year, \$4.8 billion effort to help the agency develop its next manned spacecraft. The program is the first part of the Space Launch Initiative, a plan to create a fleet of two-stage reusable spacecraft that could replace the shuttle fleet in 12 to 15 years. NASA's nationwide network of research and space centers will participate along with the contractors. Kennedy Space Center is expected to review plans dealing with maintenance and ground support for a new spacecraft. Marshall Space Flight Center in Huntsville, Ala., will lead the effort. "We'll develop a rocket that is as reliable as a jet engine is today," NASA program manager Dennis Smith said. The goal is a manned spacecraft 10 times cheaper to operate and 100 times safer than the shuttle. ["NASA awards contracts for rocket development," **Florida Today**, May 18, 2001, p 1A.]

MAY 18: A Boeing Delta 2 rocket blasted off from Cape Canaveral Air Force Station on Friday on a mission to loft a spacecraft into orbit for a spy satellite agency. The rocket, which lifted off from Launch Pad 17B at 1:45 p.m. was carrying the \$130 million Geosynchronous Lightweight Technology Experiment Satellite. ["Rocket launches with spy satellite," **Florida Today**, May 19, 2001, p 1B.]

MAY 19: Space analysts, who have asked since January whom President Bush would pick to head NASA, now wonder whether anyone wants the job. A new NASA chief would work for an administration that favors military uses of space and offers no prospects for an increased budget during the next four years. The White House is known to favor an administrator from the private sector, but salary could be a complication as the job pays markedly less than those held by aerospace industry executives. Most experts speculate the post is best suited to someone who has significant savings and political aspirations. ["Search for new NASA chief taking time," **Florida Today**, May 20, 2001, p 1A.]

MAY 23: Shuttle Atlantis' planned June 14 launch from Kennedy Space Center will be delayed several days so about 500 of the 20,000 tiles that protect the ship from the heat of re-entry will have a chance to dry out. The tiles were soaked during four days of rain at Edwards Air Force Base in California after Atlantis' Feb. 20 landing there. Technicians discovered some of the tiles were still wet during checks made before the shuttle's planned rollout to its launch pad at KSC this week. The launch has been tentatively reset for June 16. Atlantis is scheduled for an 11-day mission to the International Space Station. ["Atlantis launch delayed," **Orlando Sentinel**, May 24, 2001.]

MAY 24: For the second time in as many days, NASA managers reset shuttle Atlantis' launch date after a new assessment of work needed to dry the ship's critical heat tiles. Atlantis is now scheduled to lift off from Kennedy Space Center at 1:45 p.m. June 20, provided an Atlas rocket carrying a communications satellite launches as planned the day before from adjacent Cape Canaveral Air Force Station. If the Atlas needs a second attempt, the shuttle flight would slip to 1:23 p.m. June 21. ["Wet heat tiles spur new delay in Atlantis' launch date," Orlando Sentinel, May 25, 2001, p A6.]

MAY 29: A weekend of hovering over heat lamps proved enough to dry out shuttle Atlantis' delicate heat shield tiles and clear the way for next month's launch. Kennedy Space Center technicians were to move the orbiter Tuesday to the Vehicle Assembly Building where it will join this week with an external tank and twin solid-fuel rockets. However, the move was delayed again by several hours as storms approached. Managers also did not want to move the orbiter during a shift change. The stack could move to the launch pad as early as Sunday, NASA spokesman Joel Wells said. Atlantis is tentatively scheduled to launch at 1:45 p.m. June 20 on a mission to space station Alpha. ["Shuttle Atlantis' tiles dry, ready for June 20 launch," Florida Today, May 30, 2001, p 1A.]

◆ The first booster rocket for the Delta 4 program slowly rolled off a ship and into a testing building at Cape Canaveral Air Force Station on Tuesday. The Delta 4 is Boeing's largest and strongest addition to its fleet. It is the answer to the Air Force's effort to reduce unmanned space launch costs. In 1998, the Air Force agreed to pay Boeing \$1.8 billion for 19 launches, with liftoffs set to begin in March. But the unloaded booster won't ever fly into space. It is a strictly a test rocket. The first real rocket is scheduled to arrive at the Cape in August for a March launch. ["Delta 4 booster here for tests," Florida Today, May 30, 2001, p 1B.]

MAY 30: NASA's next two shuttle flights were postponed because of problems with the international space station's new \$900 million robot-arm system. The 57-foot Canadian construction crane could need surgery to replace a balky shoulder joint. The joint failed last week during tests of the arm's backup command circuit. An attempt to fix the problem with new computer software was unsuccessful. The arm's primary command circuit is working fine. But NASA officials don't want to tackle critical station-assembly tasks without a fully functional backup system. Shuttle Atlantis had been scheduled to head to the outpost June 20 with the next major station component, a \$164 million airlock that will serve as a staging area for spacewalks. The flight will be delayed at least three weeks until early July. The repair work likely would be done by shuttle spacewalkers Dan Barry and Patrick Forrester on a supply and crew-exchange mission aboard Discovery originally scheduled to lift off July 12. That launch has been reset for no earlier than the first week of August. If Discovery's crew has to fly first to do maintenance on the robot arm, Atlantis' airlock mission could slip to September. ["Space station develops arm trouble, so shuttles must wait," Orlando Sentinel, May 31, 2001.]

JUNE 2001

JUNE 4: The United Space Alliance (USA) is bracing for a strike by more than 600 shuttle workers in the International Association of Machinists and Aerospace Workers. The local union told USA it would strike at midnight Sunday, one day before shuttle Atlantis is to roll out to the launch pad for an early July launch. The union indicated that workers are unhappy with their contract, but has not publicly disclosed the specifics. USA is a joint venture by The Boeing Co. and Lockheed Martin. Working under NASA supervision, the company prepares shuttles for launch. A walkout would cost USA about 10 percent of its shuttle preparation work force, though the company insists it can meet the shuttle launch schedule even without the workers. USA spokeswoman Kari Fluegel said the company is looking over its strike plan and will move non-striking workers and some managers into the vacant positions. She said safety will not be compromised. The union workers operate cranes, move and install work platforms and carry out other tasks for the shuttle fleet. [Web posted. (2001). [USA Shuttle Workers Threaten To Strike [Online]. Available WWW: <http://www.space.com/> [2001, June 4].]

JUNE 5: NASA's Genesis spacecraft arrived at the Shuttle Landing Facility last week aboard an Air Force C-17 aircraft. Built by Lockheed Martin Astronautics in Denver, Colo., the spacecraft will undergo final launch preparations in the Payload Hazardous Servicing Facility. Genesis will capture samples of the ions and elements in the solar wind and return them to Earth for scientists to use to determine the exact composition of the Sun and the solar system's origin. Launch aboard a Boeing Delta II rocket is scheduled for July 30 at 12:36 p.m. EDT. NASA's Genesis project is managed by the Jet Propulsion Laboratory in Pasadena, Calif. ["Genesis," **KSC Countdown**, June 5, 2001.]

◆ A Senate committee named NASA fourth in its "top 10 worst examples of mismanagement." The Senate Governmental Affairs Committee authored the study titled "Government at the Brink." The report released June 5 cited cost overruns on the international space station, the failure of the Mars Polar Lander mission and the cancellation of the X-33 experimental rocket as examples of NASA mismanagement. [Web posted. (2001). NASA Places Fourth on U.S. Government Mismanagement List [Online]. Available WWW: <http://www.space.com/> [2001, June 5].] "Report rips NASA's money management," **Florida Today**, June 6, 2001, p 1A.]

◆ The failed mission of the X-43A experimental aircraft has delayed the Thursday (June 7) flight of a new satellite to study the sun. NASA has postponed the High Energy Solar Spectroscopic Imager mission until at least Tuesday (June 12) morning. The satellite was to be carried on a Pegasus rocket, similar to the one that carried the X-43A. The Pegasus rides attached to an airplane wing before being released in midair. The Stargazer L-1011 airplane that would carry the Pegasus and the satellite was scheduled to take off from Cape Canaveral Air Force Station on Thursday. But on Saturday, NASA had to destroy its hypersonic test vehicle after the Pegasus carrying the X-43A failed five seconds after launch over the Pacific Ocean. "The L-1011 with the Pegasus will stay here until they decide to press on," Kennedy Space Center spokesman George Diller said Monday. ["Failed mission delays rocket," **Florida Today**, June 6, 2001, p 1B.]

JUNE 6: Union representatives for space shuttle workers and United Space Alliance on Wednesday were seeking a meeting in a last-ditch effort to end their contract stalemate and avoid a strike. Both sides were trying to schedule the meeting after the union moved up the deadline for the strike to begin to 12:01 a.m. Saturday. They are hoping to avoid an unprecedented walkout at

Kennedy Space Center. The roughly 630 members of Local 2061 of the International Association of Machinists and Aerospace Workers had been scheduled to go on strike 12:01 a.m. Monday. But union leaders changed the deadline in a tactical move to give the company less time to prepare for a walkout. Still, the union was hoping for an agreement after Houston-based United Space Alliance, the prime contractor for the shuttle program, indicated a willingness to reconsider its contract offer, which was rejected Saturday by about 90 percent of Local 2061 members. The union's previous three-year contract with United Space Alliance expired June 1. United Space Alliance would not discuss specifics about its contract offer. The last time the Machinists union struck at KSC was in July 1994, against EG&G. That walkout lasted almost four months. ["Union tightens strike deadline," **Florida Today**, June 7, 2001, p 1A & 2A.]

◆ NASA and Lockheed Martin are studying two small cracks found in an external shuttle tank under construction in Michoud, La. They also must decide whether to inspect NASA's inventory of shuttle tanks, including the one Atlantis will ride into orbit next month. The tanks carry 500,000 gallons of super-cold fuel for the orbiter's three main engines. The 1 ½ inch long cracks were discovered Monday in support ribs of one of the sections that makes up the hydrogen tank. The flawed tank is slated for use on a future mission. Mission managers at Kennedy Space Center have been told of the find, but are waiting for conclusions from the investigation to decide whether to examine all tanks at the launch complex. ["Possible fuel tank check could further delay Atlantis," **Florida Today**, June 7, 2001, p 1A.]

◆ The new Atlas 5 rocket inched its way down an airplane ramp Wednesday morning, shrouded in a white bag. The Lockheed Martin booster, protected by an oversized sheet during flight, joined its Centaur upper stage at Cape Canaveral Air Force Station, where Lockheed will begin testing and preparation for the first Atlas 5 flight. A payload for that flight, scheduled for May 9, has not yet been announced. ["Atlas 5 arrives for first flight," **Florida Today**, June 7, 2001, p 1B.]

JUNE 8: Union representatives for 600 space shuttle workers reached a tentative contract agreement Friday with NASA contractor United Space Alliance. As a result, the union postponed a strike that was set to start at 12:01 a.m. today. Members of Local 2061 of the International Association of Machinists and Aerospace Workers are scheduled to vote on the proposed agreement at 10 a.m. today during a union meeting on Merritt Island. Friday's proposed settlement temporarily avoided a first-ever strike by workers who do the hands-on processing of NASA's shuttle fleet. ["Shuttle workers, contractor avert strike," **Florida Today**, June 9, 2001, p 1A.]

JUNE 9: Threats of a strike at Kennedy Space Center dissolved Saturday afternoon when union members agreed to accept the negotiated contract offered by United Space Alliance. The vote formalized an agreement Friday evening between USA and the International Association of Machinists and Aerospace Workers negotiators. Members of Local 2061 voted to accept the three-year contract following the two-hour union meeting on Merritt Island. ["KSC workers drop threat of walkout," **Florida Today**, June 10, 2001, p 1B & 2B.]

JUNE 11: Shuttle Atlantis' move to launch pad 39B has been postponed again because of ongoing questions about space station Alpha's robot arm. Atlantis was to roll to the pad today, but will wait while Alpha ground controllers try to decipher computer problems with the arm. If Atlantis makes it to the pad this week, it can still make a July 7 launch date. A July 12 launch date can be achieved as long as Atlantis rolls out of the Vehicle Assembly Building by June 19. NASA spokesman Kyle Herring said the agency does not want to launch Atlantis later than July 12 in order to protect the Aug. 5 launch date for Discovery's mission to swap space station crews.

If Atlantis has to wait inside the assembly building past next Tuesday, Discovery's mission takes priority and workers will begin making preparations to launch Discovery on Aug. 5 delaying Atlantis until late September. Atlantis will carry an airlock to Alpha. Only the station's arm is long enough to move the airlock from the shuttle's cargo bay onto the station. ["Alpha's quirky arm delays rollout," **Florida Today**, June 12, 2001, p 1B.]

JUNE 13: Kennedy Space Center's structures are showing their age, including high-pressure helium lines and other pipes that feed shuttles on the launch pad. The tracked crawlers that carried Saturn 5 rockets on their shoulders and now roll shuttles to the launch pad are rusting, their steel corroding in Florida's salty air. It would cost about \$400 million to modernize the agency's infrastructure. That isn't likely to happen because NASA is cutting everything it can and putting off other projects to cover a \$4 billion cost overrun on the International Space Station. "In this budget we just did not have room to do it," NASA Administrator Dan Goldin said recently. "We are going to have to make some very hard, tough decisions." It would cost about \$85 million to improve the Vehicle Assembly Building's façade, made of more than 1 million square feet of siding. The 32-ton door panels, roof segments and miles of cables to the launch pad also could use some work. "Budget problems are always going to be with you, but you have to step up and deal with these issues," said Bob Sieck, former launch director and a consultant to NASA's Aerospace Safety Advisory Panel. ["KSC buildings show their age," **Florida Today**, June 14, 2001, p 1B & 2B.]

◆ Discovery orbiter rolled over to the Vehicle Assembly Building on June 13. The orbiter is being prepared for launch on mission STS-105 NET Aug. 5. Launch date for Atlantis on mission STS-104 has been rescheduled for NET July 12. Rollout to Launch Pad 39B is targeted for June 19. ["Discovery rolls to VAB, Atlantis awaits decision," **KSC Countdown**, June 14, 2001.]

JUNE 15: Gusts of wind approaching hurricane force and dime-size hail rocked the Brevard County coast Friday, knocking over trees and power lines and damaging houses from the Volusia-Brevard line south to Cocoa Beach. At least one tornado touched down at Kennedy Space Center just before 4 p.m., about a mile north of the Shuttle Launch Facility, according to Kennedy Space Center radar. No damage was reported. ["Twister hits within mile of shuttle launch site," **Orlando Sentinel**, June 16, 2001, p C1 & C2.]

JUNE 16: The U.S. Astronaut Hall of Fame has selected shuttle commanders Robert Crippen, Joe Engle, Rick Hauck and Richard Truly for induction later this year. The four will be the first shuttle astronauts to join the hall of Fame, which includes 44 other astronauts from the Mercury, Gemini, Apollo, Skylab and Apollo-Soyuz programs. Crippen flew the first shuttle mission on Columbia in 1981. Engle commanded while Truly piloted Columbia's second flight. Truly later served as NASA administrator. Hauck was commander on the first mission to retrieve two communications satellites. ["4 astronauts selected to hall," **Florida Today**, June 17, 2001, p 1B.]

JUNE 19: A Lockheed Martin Atlas 2AS rocket successfully launched from Cape Canaveral Air Force Station's launch pad 36B with an ICO Global Communications satellite at 12:41 a.m. today. ["Atlas lifts off," **Florida Today**, June 19, 2001, p 1A.]

JUNE 20: NASA and Air Force contractor Space Gateway Support may have to cut its work force by October because of a budget crunch, company President Mike Butchko said Wednesday. Based on budget discussions with NASA and Air Force officials, Space Gateway Support is planning for cuts totaling about \$8 million for the fiscal year beginning Oct. 1, Butchko said. He said it is unknown how many jobs will be eliminated. ["Cape contractor expects staff cuts," **Florida Today**, June 21, 2001, p 1A & 2A.]

◆ Early morning lightning stalled shuttle Atlantis' oft-delayed move to the launch pad Wednesday. The orbiter, its external tank and twin solid-fueled rockets rolled about 500 yards out of the Vehicle Assembly Building about 2:30 a.m. Wednesday before Cape weather watchers picked up lightning about 15 miles away, NASA spokesman Joel Wells said. Workers immediately put the shuttle transporter in reverse, returning the spacecraft to the protective hangar. They were to make another attempt shortly after midnight today. The delay is not expected to hold up the July 12 launch of Atlantis on a mission to space station Alpha. Nor is it expected to interfere with breaks scheduled for the shuttle work force. ["Lightning keeps Atlantis off pad," **Florida Today**, June 21, 2001, p 8A.]

JUNE 25: If NASA can't accommodate more than three residents on the International Space Station, its foreign partners could pull their support for the outpost, jeopardizing future efforts, the program's manager said Monday. A \$4 billion cost overrun on the station put the crew size in question because NASA could no longer afford to build a living module or escape craft on its own. The station needs both to host more than three crew members. Without six or seven crew members, scientific research on the station – the primary purpose of the outpost – will be cut by 40 percent. NASA and its space station partners won't know for about two years whether the outpost will host more than three residents, program manager Tommy Holloway said. President Bush's space station plan does not include a station crew larger than three. ["Station partners concerned," **Florida Today**, June 26, 2001, p 1A & 2A.]

JUNE 26: The world's first space tourist Tuesday urged NASA to resume flying civilians into orbit aboard the shuttle to boost public support for government and commercial space exploration. In testimony before a congressional panel, multimillionaire Dennis Tito reported that since returning from his historic April visit to the International Space Station, it has become apparent to him that Americans from all walks of life shared his dream of soaring above Earth's atmosphere to experience the weightlessness of space. "I suggest NASA reconsider its civilian-in-space program so, as a culture, we can better understand and experience the pleasures of flying in space," Tito said. NASA canceled its civilian-in-space program after the 1986 explosion of the shuttle Challenger when teacher Christa McAuliffe and six other astronauts died. ["Tito testifies on space tourism," **Florida Today**, June 27, 2001, p 3A.]

◆ John Finley Yardley, who helped design the craft that put the first American into space and later managed the space shuttle program, has died. He was 76. ["Space pioneer dies at 76," **Florida Today**, June 28, 2001, p 7A.]

JUNE 28: Discovery rollout to the pad yesterday was scrubbed. The new rollout is scheduled for Friday, starting at 2 a.m. The launch date for mission STS-105 is still scheduled for NET Aug. 5 at 7:05 p.m. EDT. The mission will carry the Expedition 3 crew to replace the Expedition 2 crew. It is also a supply flight to the International Space Station, carrying MPLM Leonardo on the round trip. ["Discovery to roll to pad June 29," **KSC Countdown**, June 28, 2001.]

JUNE 29: The Canaveral Port Authority wants to move the historic Cape Canaveral Lighthouse from Cape Canaveral Air Force Station to Jetty Park at Port Canaveral to increase public access to the lighthouse and make it more of a tourist draw. "The lighthouse would be a great tourist attraction at Jetty Park, but you would destroy the historical significance of it," said Jimmey Morrell, a retired Air Force general and chairman of the Air Force Space and Missile Museum Foundation. The lighthouse generally is not open to the public. Tourists can see the lighthouse as they pass the site during bus tours of Kennedy Space Center. But the tours don't stop at the lighthouse, and the area is closed to the public during rocket and space shuttle launches. The

150-foot-tall lighthouse dates to 1848, when the original, smaller version of the structure was built. It is the oldest man-made structure at Cape Canaveral, and is expected to be added to the National Register of Historic Places this year. The lighthouse, which has been automated and unmanned since 1967, would be taken out of service if it is moved to Jetty Park, said Port Authority spokeswoman Dixie Sansom. ["Port officials pursue plan to move lighthouse," **Florida Today**, June 30, 2001, p 1A & 2A.]

JUNE 30: A Delta 2 rocket carrying the Microwave Anisotropy Probe (MAP) satellite was launched from Cape Canaveral Air Force Station's Launch Complex 17B at 3:46 p.m. EDT. The satellite will take about 5 million readings, and scientists will use that data to make a map of the universe as they think it existed 400,000 years after the big bang. ["Time traveler," **Orlando Sentinel**, July 2, 2001, p A3. "Delta launch sends MAP on journey to look at the history of the universe," **KSC Countdown**, July 3, 2001.]

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JULY 2: Shuttles could detour to the New Mexico desert instead of California during the fall as the runway at Edwards Air Force Base undergoes repairs, NASA officials said. White Sands Space Harbor in New Mexico's Akalai Flats will take over the backup role from Sept. 1 to Nov. 29. The site is normally the third in line to handle a landing after Kennedy Space Center and Edwards. The 3-mile runway at KSC will remain the primary landing site. No shuttle missions are planned during that time. A shuttle launch is scheduled for Nov. 29, the day the Edwards runway is to reopen. ["Shuttles may land at White Sands," **Florida Today**, July 3, 2001, p 1B.]

◆ After several weather delays, Space Shuttle Discovery rolled out to Launch Pad 39A where it will undergo final preparations for launch on mission STS-105, targeted for next month. ["Discovery arrives at launch pad 39A," **KSC Countdown**, July 3, 2001.]

JULY 6: Fifteen illegal aliens, believed to be Chinese and Jamaican, were taken into custody Friday in a secure area at Kennedy Space Center, a little more than a mile south of the launch pad where shuttle Discovery awaits liftoff next month. The eight women and seven men were in good health, showing no signs of hunger, thirst or fatigue, officials said. "They were very quiet, solemn, helping each other cope," KSC security chief Calvin Burch said. Border Patrol agents are investigating whether the group was brought ashore on boats by smugglers. The immigrants would not offer any information about their trip. Several ships just offshore were inspected by the Coast Guard soon after the immigrants were found, and were cleared of any involvement. The group came ashore with about five small backpacks and purses carrying food, cash and a credit card. The refugees were bused to a detention center in Winter Haven, where they have been charged with entering the country illegally. A Chinese woman found late Friday at the Kennedy Space Center brings to 16 the number of Chinese and Jamaican illegal immigrants who turned up mysteriously. The group remained behind bars at the Orange County Detention Center in Orlando. ["15 refugees found at KSC," **Florida Today**, July 7, 2001, p 1A & 2A. "16th refugee discovered at the Cape," **Florida Today**, July 8, 2001, p 1A.]

◆ Executives of The Boeing Co. changed their minds hours before they were going to notify local space-industry workers that they would be laid off later this summer. The company decided against giving an undisclosed number of workers layoff notices Friday. The notices would have started the clock for possible staff cuts in two months. Boeing said it may need fewer engineers and others workers as it completes manufacture of components for the International Space Station. The company employs about 2,700 people at Kennedy Space Center and Cape Canaveral Air Force Station. ["Boeing puts off decision on layoffs," **Florida Today**, July 7, 2001, p 1A & 8A.]

◆ A 50,000-square-foot hangar complex at the Kennedy Space Center, originally built to house a new generation of reusable launch space vehicles, instead will be used to store and maintain ground equipment for the space shuttle. Spaceport Florida Authority owns the \$4.9 million complex and will lease it to United Space Alliance. The two parties signed the lease contract Friday. The complex includes the hangar and two NASA-funded buildings. NASA owns the land where the complex is located. ["Hangar to hold equipment for shuttle," **Florida Today**, July 7, 2001, p 8A.]

◆ Space Gateway Support, a NASA and Air Force contractor, will eliminate 21 security police officer jobs later this month because of budget constraints, the company said Friday. Five of the

21 positions already are vacant, so only 16 officers will be laid off July 27, said Space Gateway Support spokesman Bob Koch. The company is also considering eliminating five or six non-security jobs, he said. Space Gateway Support employs a security force of about 250 police officers at Kennedy Space Center, Cape Canaveral Air Force Station and Patrick Air Force Base under the Joint Base Operations and Support Contract. ["NASA contractor to cut 21 security officer jobs," **Florida Today**, July 7, 2001, p 8A.]

JULY 8: The five astronauts set to ride space shuttle Atlantis into orbit Thursday made their way to Kennedy Space Center on Sunday night for final mission preparations. Atlantis, commanded by Steven Lindsey, will carry the Quest airlock module to space station Alpha. Susan Helms will use the outpost's own 58-foot-long robot arm to pull the 6 ½ ton module out of the shuttle and place it onto the station. At the same time, Atlantis astronaut Janet Kavandi will use the orbiter's 50-foot arm to aid space walkers Michael Gernhardt and Jim Reilly as they connect the cables between the station and the new segment. Charles Hobaugh, pilot, rounds out the crew. ["Atlantis crew lands at KSC," **Florida Today**, July 9, 2001, p 2A.]

◆ A subcontractor working at launch pad 37 was killed when a pipe hit him on the head. The man, whose name was not released, was struck and killed by a pipe coupling he was disassembling while the pipe was still under pressure, said Bill Whiting, a spokesman for the Washington Group Inc. The group subcontracted Precision Fabricating and Cleaning, for whom the victim worked. The accident occurred about 10 a.m. at launch pad 37, which is the new site of the Delta 4 rocket. ["Pressurized pipe kills KSC worker," **Florida Today**, July 20, 2001, p 1B.]

JULY 9: A group of Chinese refugees who were discovered on a beach near a launch pad at Kennedy Space Center were moved to Miami on Monday for processing at the Krome Avenue Detention Center. The 15 Chinese and one Jamaican will be facing an immigration judge in Miami who will decide who can stay in the country. ["Refugees who landed at KSC moved to Miami," **Florida Today**, July 10, 2001, p 1B.]

JULY 10: An improved main engine will be tested in flight for the first time when shuttle Atlantis lifts off from the Kennedy Space Center. Equipped with a new high-pressure fuel turbopump, the so-called Block 2 engine is the final result of a 15-year-long, \$1 billion effort to make the shuttle's liquid-propellant rocket more powerful, safer to fly and less costly to maintain. In 1986, Pratt & Whitney was awarded a contract by NASA to take the original turbopumps and redesign them. At the same time, the main engine manufacturer – Rocketdyne, now part of Boeing – worked with NASA to redesign the other elements of the engine plumbing. [Web posted. (2001). Atlantis Crew to Test Fly New, Safer Shuttle Main Engine [Online]. Available WWW: <http://www.space.com/> [2001, July 10].]

◆ The GOES-M satellite launch from Complex 36-A, Cape Canaveral Air Force Station, has been rescheduled to NET July 19. The satellite was enclosed in the payload fairing July 2 and transferred to the pad July 6. GOES-M is the last in the current series of advanced geostationary weather satellites in service. GOES-M has a new instrument not on earlier spacecraft, a Solar X-ray Imager, which can be used in forecasting space weather and the effects of solar storms. ["GOES-M launch slips to NET July 19," **KSC Countdown**, July 10, 2001.]

◆ As many as 20 percent of Americans believe that the Apollo moon landings were faked. NASA has been forced to officially deny that Apollo was a fraud. [Web posted. (2001). One giant leap for lunar skeptics [Online]. Available WWW: <http://www.orlandosentinel.com/> [2001, July 10].]

◆ Money planned for the space shuttle program may be slashed by about \$1 billion between 2003 and 2007, industry and government officials said. NASA recently notified its top five space shuttle contractors to develop plans to cope with the reductions, which would amount to \$200 million to \$300 million a year. The cutbacks could lead to a smaller shuttle work force, with at least one less shuttle launch per year. News of the reduction comes at the same time NASA is figuring out how to cope with \$4.8 billion cost overrun in the International Space Station program. The president's Office of Management and Budget has demanded NASA make up for the space station overrun within its budget for the human space flight program, which includes the space station, space shuttle and astronaut programs. The reduction to shuttle program plans reflects, in part, a budget providing only a 1.8 percent increase for inflation, rather than a typical 4 percent or so. ["NASA to slice shuttle spending," **Florida Today**, July 11, 2001, p 1A & 4A.]

◆ Shuttle Atlantis will have one less emergency landing strip available in Africa if something happens on this trip into orbit. NASA did not send support staff to Ben Guerir, Morocco, this launch for security reasons, NASA spokesman Dwayne Brown said. "There is a general world-wide elevated level of concern for the U.S.," said Jim Halsell, an astronaut and shuttle launch manager. Kennedy Space Center has been on heightened security as well, doing more intensive badge checks at its gates. "There was no reason to expose our people," Halsell said. "I'm not at liberty to divulge additional information." ["Security issues close emergency site," **Florida Today**, July 11, 2001, p 5A.]

JULY 11: Rising costs in NASA's shuttle program could make Columbia's planned flight next May its last. NASA managers are considering retiring the agency's oldest orbiter as one of several options to deal with projected budget shortfalls over the next six years. Those shortfalls are expected to total under \$800 billion between 2002 and 2007. "Given the manifest we have today, after 2004 or the beginning of 2005 it's questionable whether it would be cost-effective to keep Columbia fully operational," said Joe Rothenberg, NASA's associate administrator for the Office of Space Flight. The \$2 billion orbiter celebrated the 20th anniversary of its first launch – also the first in shuttle history – last April. With 26 missions under its belt, it would be the first orbiter taken out of service as well. Only two more flights are firmly slated aboard the ship: a January mission to service the Hubble Space Telescope and a research flight planned for next May. Rothenberg stressed that no decision about Columbia's future has been made. NASA is talking with other federal agencies about possible missions after the May flight. It's also unclear how much money would be saved from mothballing the ship, which returned in March from a 17-month overhaul in California. ["Cash woes could end flights for Columbia," **Orlando Sentinel**, July 12, 2001, p A1 & A8.]

JULY 12: Space Shuttle Atlantis rocketed toward space with its crew of five astronauts. Liftoff was on-time at 5:04 a.m. The STS-104 mission is delivering the joint airlock module to the Space Station. It is the seventh major component to be added to the structure. ["Liftoff of Atlantis an early morning spectacle," **KSC Countdown**, July 12, 2001.]

JULY 14: NASA has spent almost \$100 million in taxpayer money to build a satellite that is headed for a storage bin in Maryland. Triana was scheduled for a November flight into space, where it would measure ozone in the Earth's atmosphere while also beaming round-the-clock photos of Earth to the Internet. Because of an indefinite launch delay, Triana is headed for storage at Goddard Space Flight Center in Maryland. The satellite was the idea of former Vice President Al Gore. ["Politics puts \$100 million satellite on ice," **Orlando Sentinel**, July 15, 2001, p A1 & A8.]

JULY 17: NASA and the Technological Research and Development Authority each are chipping in \$75,000 to get the word out to the Florida business community about producing and marketing technology developed at the Kennedy Space Center. The goal is to get more Florida companies interested in taking technology developed at KSC and expanding their businesses to create more high-tech jobs throughout the state. It's part of a program called NASA-KSC/Florida Dual-Use Technology Partnership. The venture between NASA and the development authority continues through April 2003. "The bottom line here is technology transfer," said Dave Kershaw, director of the Florida/NASA Business Incubation Center and project manager for the Dual-Use Technology Partnership program. A main mission of the Technology Research and Development Authority is to promote the use of new technology as a way to help Florida economy. ["Agency pushes space tech," **Florida Today**, July 18, 2001, p 1C. & 2C.]

JULY 19: The landing of Atlantis following its mission to the International Space Station has been delayed nearly a full day. The orbiter landing at KSC is expected Tuesday, July 24, at 12:36 a.m. EDT. ["Mission Update," **KSC Countdown**, July 19, 2001.]

◆ Although security staffing at Kennedy Space Center is at the lowest level possible, recent events mean identification passes are being studied a bit more carefully, eyes are sharper and security officers are more noticeable. Those events: The U.S. State Department is warning of possible terrorist attacks abroad; NASA decided not to send a team to an emergency shuttle landing site in Morocco because of unspecified threats; Illegal immigrants recently washed ashore within three miles of launch pad 39A where shuttle Discovery rested; Last week, KSC's security contractor handed out pink slips to 16 security personnel at the center. KSC spokesman Bruce Buckingham said the center has been assured that "our security force is intact and that there is no reason to believe that we are less secure than in the past. "We are at a heightened state of awareness because of the advisories given by the Department of State," he said. "We realize we have a great deal at stake here at Kennedy Space Center." A submachine gun-toting security guard standing sentinel next to Discovery astronauts Thursday was not an unusual sight, Buckingham said. "We realize the astronauts are one of our assets and we intend to have a security presence, when necessary, when they are at Kennedy Space Center," he said. ["KSC keeps its guard up," **Florida Today**, July 20, 2001, p 1A & 3A.]

◆ NASA Administrator Daniel Goldin announced July 19 the Viking 2 Lander has been renamed after the late Gerald Soffen, a lead scientist for the Viking project that made the first successful soft-landings on the Red Planet. Goldin made the proclamation at the symposium at the National Geographic Society in Washington, D. C., celebrating Viking and looking to the future of Mars exploration. Viking 2 touched down in Utopia Planitia on Sept. 3, 1976. The lander operated on the surface for 1,281 Mars days and ceased operation April 11, 1980. ["Lander renamed to honor scientist," **Florida Today**, July 29, 2001.]

JULY 20: Twenty-five years ago today, man first landed his handiwork on another planet. NASA's Viking 1 Lander touched down on the Martian plain July 20, 1976, seven years to the day after man first walked on the dusty moon. NASA didn't revisit the planet's surface until the Pathfinder and Sojourner rover landed in 1997. ["Viking paid Mars a visit 25 years ago," **Florida Today**, July 20, 2001, p 1B & 2B.]

◆ The Boeing Co. on Friday told 85 workers – mostly engineers and support staff – they might be laid off in the next 60 days. Boeing said it might need fewer engineers and other workers, as it completes manufacture of components for the International Space Station. The company said the possible worker reductions are unrelated to NASA's cost overrun on the space station. The 85 workers represent about 3 percent of Boeing's total employment in Brevard County. The

realignment involved the "Payload Ground Operations Contract" and the International Space Station programs that support Boeing's Human Space Flight and Exploration effort, said Renee Vanderbrink, Boeing's site operations director. ["Boeing warns engineers, workers of possible layoffs," **Florida Today**, July 21, 2001, p 1A & 3A.]

JULY 21: Forty years ago today, astronaut Virgil "Gus" Grissom became the second American to launch into space. In honor of Grissom's historic flight, Kennedy Space Center Visitor Complex will offer a tour stop at the launch site of Liberty Bell 7 and a tour of the Mercury mission's launch control. The center will offer the special tour stops for the next week. ["KSC offers tour stop to mark Grissom's launch," **Florida Today**, July 21, 2001.]

JULY 22: Launch of an Atlas 2A rocket with a weather satellite has been postponed because of bad weather. The rocket carrying a GOES satellite was scheduled to lift off at 3:01 a.m. today. But lightning struck near Launch pad 36 at Cape Canaveral Air Force Station during Saturday evening's thunderstorms. [Web posted. (2001). Lightning strike delays Atlas launch [Online]. Available WWW: <http://www.floridatoday.com/> [2001, July 22].]

JULY 23: A satellite that tracks hurricanes, severe thunderstorms and flash floods, GOES-M, successfully separated from its rocket at 3:50 a.m. Monday and began drawing power from the sun 50 minutes later. An Atlas 2A lifted off from Cape Canaveral Air Force Station at 3:23 a.m. from Launch Complex 36B. ["Atlas delivers satellite after morning launch," **Florida Today**, July 24, 2001, p 2A.]

◆ The landing of Atlantis has been delayed 24 hours due to weather concerns. Another landing attempt has been scheduled for 11:39 p.m. Tuesday night. If successful, Atlantis will be towed to Orbiter Processing Facility bay 2 where workers will begin getting the orbiter ready for its next mission, STS-110, another assembly flight to the International Space Station currently scheduled in February 2002. ["Atlantis landing waved off due to weather concerns," **KSC Countdown**, July 24, 2001.]

JULY 24: Shuttle Atlantis touched down on Kennedy Space Center's runway at 11:39 p.m. Tuesday after traveling more than 5 million miles and spending two extra days in orbit. Weather at the space center was much calmer Tuesday night than just 20 hours before when rain near KSC forced NASA to call off two planned landings early Tuesday morning. The STS-104 mission marks the end of the International Space Station's second phase. The next phase will begin with mission STS-110 in February 2002, when Atlantis will deliver the SO Integrated Truss Structure. ["Atlantis returns to KSC," **Florida Today**, July 25, 2001, p 1A. "STS-104 ends with perfect landing at SLF," **KSC Countdown**, July 26, 2001.]

JULY 26: The launch of the Air Force Titan 4B rocket with the Defense Support Program missile warning satellite was postponed late Thursday. The new launch window will run from 4:08 until 8:08 a.m. Saturday, Maj. Mike Rein said. The rocket was expected to launch at 4:08 a.m. Friday, but was delayed when routine tests on the booster second stage "gave unexpected readings," Rein said. ["Titan 4B launch postponed," **Florida Today**, July 27, 2001, p 1A.]

JULY 30: NASA Administrator Dan Goldin urged Florida's universities to join in experiments for the international space station and ordered Kennedy Space Center to help make it happen. Goldin told KSC Director Roy Bridges on Monday to create a plan in 30 days aimed at increasing the roles of Florida universities. Goldin's directive came at Florida Space Summit II at the University of Central Florida, a gathering of state and national officials, including Gov. Jeb Bush and Florida U.S. Sens. Bob Graham and Bill Nelson. NASA spends nearly \$1 billion a year on

university research, but little flows through Kennedy Space Center, and Florida universities combined get only 2 percent, about \$21 million. Goldin, Bridges and area universities hope to get more research money flowing through the space center. UCF believes it is well-positioned to expand its research at the cape into launch technologies even without UF's laboratory. UCF hopes Congress soon will approve a \$9 million research grant for hydrogen-fuel research at the space center. ["NASA boosts Florida schools' role," **Orlando Sentinel**, July 31, 2001, p A4.]

◆ Continued money problems and an inattentive White House are setting up NASA to fail, U.S. Sen. Bill Nelson said Monday at the second Florida Space Summit. "You just can't continue to starve the American space agency of funds (without jeopardizing safety)," Nelson, D-Tallahassee, said, laying the blame at 1600 Pennsylvania Avenue. "I am very frustrated with the White House budget proposal on NASA." The wide-ranging summit touched on civilian and military space issues, with key players from both sides represented. The discussions are integral to Florida's economic well-being. Florida's economy receives a \$4 billion economic boost each year from space. Both houses of Congress are preparing to vote this week on spending plans for NASA. The House budget includes \$275 million for a space station escape craft, plus \$35 million for Kennedy Space Center improvements. The Senate Appropriations Committee shifted \$150 million from the space station to support shuttle safety upgrades and space station research. ["Bush budget 'starves' NASA, Nelson says," **Florida Today**, July 31, 2001, p 1A & 2A.]

JULY 31: The launch of NASA's Genesis spacecraft aboard a Boeing Delta II rocket has been postponed to NET Wednesday, Aug. 1. The spacecraft contains a power supply component within the Startracker unit which is similar to a component that recently failed during a simulated space environment test not related to the Genesis mission. NASA and the Genesis project decided that additional time was needed to further evaluate the available data to assure that there will be no effect on the Genesis mission. The two-minute launch window opens Wednesday (August 1) at 12:31:38 p.m. EDT. [Monday's Genesis launch postponed at least 2 days," **KSC Countdown**, July 31, 2001.]

DURING JULY: The Jason 1 satellite has arrived at Vandenberg AFB, Calif., for final launch preparations leading to liftoff no earlier than Sept. 15. The French-built spacecraft is the follow-on to the Topex/Poseidon satellite, which has been making measurements of ocean surface topography for nearly a decade. The new satellite, a NASA/CNES joint project, will be launched on a Delta II booster. ["World News Roundup," **Aviation Week & Space Technology**, August 6, 2001, p 23.]

◆ In a major shift to improve its business competitiveness in space, Boeing will move 1,100 employees from California to the Kennedy and Johnson space centers in Florida and Texas. The move will relocate the core of Boeing's space shuttle and International Space Station engineering workforce to the primary NASA manned flight centers. At Kennedy, there are 2,700 Boeing employees, with about 2,000 specifically assigned to the human space flight business unit, said former astronaut Bruce Melnick, Boeing vice president at Kennedy for support operations. ["Boeing Shifts 1,100 To Spur Space Business," **Aviation Week & Space Technology**, August 6, 2001, p 39-40.]

AUGUST 2001

AUGUST 1: A \$4.8 billion cost overrun on the NASA's International Space Station has caused auditors and investigators to go over the space station's books, engineering designs and policy decisions. Perhaps the most visible group is the International Space Station Management and Cost Evaluation Task Force. Chaired by Thomas Young, a former president of Martin Marietta Corp. The 19 scientists, researchers, executives and retired military officers are expected to help NASA "restructure the business and financial approach" of the space station program, said NASA administrator Dan Goldin. Their report is due in 2002, at the beginning of the annual appropriations process. The Office of Management and Budget and NASA's inspector general are looking into aspects of space station management, oversight and spending. NASA's own internal Independent Annual Review will also focus on the space station program. ["Auditors target station spending," **Florida Today**, August 2, 2001, p 1A & 3A.]

◆ Minutes before liftoff of the Genesis spacecraft, Air Force weather officers reported thick clouds over Cape Canaveral Air Force Station's pad 17A would violate launch rules. Clouds hovered over Brevard County much of the morning, postponing the 12:31 p.m. liftoff of a Delta 2 rocket and its science payload. Liftoff was rescheduled for at 12:27 p.m. August 2, but that depends on the weather. ["Genesis delayed again by weather," **Florida Today**, August 2, 2001, p 3A.]

◆ During a recent roundtable on Capitol Hill, industry leaders lobbied hard for legislation they hope would transform today's commercial rocket launches into tomorrow's airlines in orbit. "We want the Kennedy Space Center to look more like the Orlando International Airport," said Edward Hudgins, a space researcher with the Cato Institute think tank. The space-transportation industry – when generates about \$4.5 billion a year in spending in Florida alone – consists of conventional aerospace giants such as Boeing and Lockheed Martin as well as smaller companies trying to develop cost-efficient rockets and alternatives to NASA's space shuttle. The Spaceport Equality Act, sponsored in the House by Rep. Dave Weldon, R-Palm Bay, was introduced in the Senate last week by Bob Graham, D-Fla. It aims to give spaceports, including Spaceport Florida Authority, the same tax-exempt bond status that airports enjoy. The Invest in Space Now Act would provide tax breaks until 2007 equal to the amount of space-related investment. The United States now controls only about 35 percent of the worldwide commercial space-launch market. ["Tax breaks could fuel space travel," **Orlando Sentinel**, August 2, 2001, p C1 & C6.]

AUGUST 3: A potentially serious problem with one of shuttle Discovery's twin solid rocket boosters could conspire to delay the planned launch next week of a crew-rotation mission to the International Space Station, officials said Friday. As it stands, Discovery remains scheduled to blast off from Kennedy Space Center on Thursday (August 9) on a mission to ferry a new crew to the station, then return to Earth with the current outpost tenants, Yuri Usachev, Susan Helms and Jim Voss. The launch, however, could be delayed three or four days if NASA engineers decide to replace a suspect hydraulic power unit on the shuttle's left-hand booster rocket. Still unclear is whether the repair will be necessary. ["Shuttle launch delay possible," **Florida Today**, August 4, 2001, p 1A & 2A.]

◆ NASA managers are grappling with a desire to upgrade the space shuttle fleet while launching an ambitious and expensive effort to find a replacement. The outcome of that debate largely will define human spaceflight for the next 20 to 30 years and serve as the foundation of the International Space Station program. The product of these debates likely will ensure Kennedy

Space Center's pre-eminence in the manned launch business. The Aerospace Safety Advisory Panel will make recommendations to NASA leaders this month that will determine the level of shuttle upgrades the agency should pursue. At the center of the debate is the \$4.8 billion Space Launch Initiative, meant to turn out a spacecraft design in five years that NASA and industry can build and fly by 2012. If it works, KSC likely would be the home to the new spacecraft. If not, the shuttle fleet will have to be improved significantly to keep it safe. For that, the agency has set aside about \$1.3 billion during the next five years. For now, the agency has told shuttle contractor United Space alliance to prepare maintenance schedules to keep the orbiters flying through 2012. NASA has yet to decide whether to send shuttle Discovery to California for an overhaul after next week's scheduled flight. Each shuttle is designed to fly 100 times, meaning the four-ship fleet is about a fourth of the way through its lifetime. ["NASA debates space shuttle upgrades, new craft," **Florida Today**, August 4, 2001, p 2A.]

◆ Another day of bad weather forced NASA to delay the 12:23 p.m. Friday launch of the Delta 2 rocket with the Genesis spacecraft. Weather officer Johnny Weems was concerned about thick clouds and the chance of rain at Cape Canaveral Air Force Station. Launching through thick clouds increases the chance of the unmanned rocket being struck by lightning, while flying through rain could wear away the protective cover around the spacecraft. The Genesis probe will try to capture tiny bits of the solar wind and bring them back to Earth. The launch team rescheduled Delta for Aug. 12. If they are unable to launch before Aug. 14, they must wait until December for another try. ["Weather delays launch again," **Florida Today**, August 4, 2001, p 1B.]

AUGUST 5: Space shuttle managers still are debating whether to postpone this week's launch of Discovery and replace a key hydraulics unit in one of the spaceplane's twin rocket boosters. For now, launch preparations are continuing on schedule. Discovery's seven astronauts arrived at Kennedy Space Center Sunday afternoon. Once in space, Discovery's crew will begin a 12-day mission to the international space station to swap out station crews and deliver cargo. ["Discovery launch up in air," **Orlando Sentinel**, August 6, 2001, p A3.]

AUGUST 6: Countdown for launch of STS-105 began 5 p.m. Monday, Aug. 6 The countdown includes 29 hours and 32 minutes of built-in hold time leading to a preferred launch time of about 5:38 p.m. Aug. 9, with a launch window not to exceed 5 minutes. The exact time of launch is determined by the location of the orbiting International Space Station. The STS-105 and Expedition Three crew arrived at KSC on Sunday, Aug. 5, to prepare for the launch. In a series of teleconferences since Friday, engineers at several NASA centers expressed concern about potential cracks inside a power unit of the solid rocket booster to the left side of the shuttle. "We have a high degree of confidence that there aren't any cracks in the unit in the left-hand boosters on Discovery," said NASA spokesman Joel Wells. Hours of analysis told the managers the cracks likely were isolated rather than a common flaw throughout the booster fleet, Wells said. ["The countdown clock is ticking for launch of STS-105 on Aug. 9," **KSC Countdown**, August 7, 2001. "Discovery clear to launch," **Florida Today**, August 7, 2001, p A1.]

◆ The launch of NASA's Genesis spacecraft aboard a Boeing Delta II rocket was postponed again because of unacceptable weather conditions. Launch is now scheduled to occur at 12:13:13 p.m. EDT, Wednesday, Aug. 8. The near-term Genesis launch period extends to Aug. 15. The Delta II rocket and Genesis spacecraft remain in excellent health. ["Genesis launch is rescheduled for Aug. 8 at 12:13 p.m.," **KSC Countdown**, August 7, 2001.]

◆ Turning night into day, America's heavy lifting Titan 4B rocket blasted off from Florida's space coast early Monday morning, successfully sending a new Defense Support Program (DSP)

missile warning satellite on a seven-hour journey into Earth orbit. Liftoff of the \$460 million Air Force Titan 4B from Cape Canaveral Air Force Station came at 3:28 a.m. EDT Monday with the ignition of the Titan's twin solid rocket boosters, which are second only to the Space Shuttle's in size and power. [Web posted. (2001). Titan 4 Successfully Lofts Missile Warning Satellite into Orbit [Online]. Available WWW: <http://www.space.com/> [2001, August 6].]

AUGUST 7: They look like ordinary antennas and radar sets, but the tracking gear at Cape Canaveral Air Force Station and Patrick Air Force Base are set to watch rockets very closely in the most hazardous part of their flights. That is why NASA and the Air Force will make sure a host of devices know to stop looking for a Delta 2 rocket and start scanning for a shuttle. Normally, it takes the range 29 hours to prepare for another launch, NASA spokesman Bill Johnson said. The time from the Genesis launch at 12:13 p.m. Aug. 7 to Discovery's 5:38 p.m. Thursday liftoff is barely enough. "They're just within their capability," Johnson said. Completing the switch from the Delta to the shuttle quickly enough to allow two launches in 30 hours will be a challenge Air Force personnel haven't dealt with often. The last such attempt was made in October 1998 for a Pegasus and then a Delta 2. ["Dual launches tighten tracking range's timetable," **Florida Today**, August 8, 2001, p 1A.]

AUGUST 8: After a week of rain delays, a clean launch Wednesday afternoon sent NASA's Genesis spacecraft hurtling toward the sun. Boeing's Delta 2 rocket boomed off its Cape Canaveral pad at 12:13 p.m., the first leg of Genesis' three-year mission to collect and return pieces of the solar wind. It will be NASA's first mission to bring back a piece of space since Apollo astronauts brought back moon rocks. In September 2004, Genesis will return to Earth. ["Genesis begins research mission," **Florida Today**, August 9, 2001, p 3A.]

AUGUST 9: Thick storm clouds and lightning strikes late Thursday afternoon crept close enough to Kennedy Space Center to keep shuttle Discovery on the launch pad. NASA will try to launch the orbiter again Friday (Aug. 10), but there is only a 30 percent chance of acceptable weather. Forecasters predicted a 60 percent chance for Thursday's scrubbed attempt. Friday's launch attempt is set for 5:15 p.m., with a window of less than five minutes. ["Weather forces shuttle scrub," **Florida Today**, August 10, 2001, p 1A.]

AUGUST 10: Space Shuttle Discovery lifted off at 5:10 p.m. Friday on a mission to the International Space Station. Storms edged close enough to Kennedy Space Center to force launch controllers to move up the launch by five minutes to avoid possible interference. Launch Director Mike Leinbach said he was slightly surprised by an approaching storm cloud 38 miles from the launch site. The cloud, although it dissipated, prompted the abbreviated countdown. Flight managers preferred to launch at 5:15 p.m. to save fuel, but the shuttle is expected to safely reach the station despite leaving early. Discovery is due to return to the Kennedy Space Center on Aug. 22. ["New crew rides to station," **Florida Today**, August 11, 2001, p 1A & 3A.]

AUGUST 15: Eight near-flawless launches in 11 months – the busiest schedule since 1997 – has polished the image of the aging shuttle fleet, turned an unmanned orbiting outpost into a massive International Space Station and focused the world once again on the premier manned spaceflight center. "Man, it just feels good," NASA Launch Director Mike Leinbach said after Discovery's liftoff last week. Near-flawless performance also takes the edge off an expected \$1 billion budget cut to the shuttle program during the next five years. "The budget problems that are out there, well, that stuff happens in big programs and fingers get pointed," said Mike McCulley, chief operating office for United Space Alliance. "But when you're performing...Just look at what we've done. Life's not perfect, but it's pretty darn good." NASA managers point out that millions of things must go right during each shuttle launch, and that is sometimes lost on

observers. They're elated by the shuttle fleet's run, and determined to avoid complacency. It is and will remain the backbone of manned space flight during the next 15 to 20 years. The current pace will not be equaled for several years. White House budget requests for NASA call for six flights a year, surging to seven if necessary. The next launch is not until Nov. 29. ["NASA hopes successful year in space calms critics," **Florida Today**, August 16, 2001, p 1A & 3A.]

◆ Shuttle Discovery may not get its planned facelift after it returns home next week, shuttle program manager Ron Dittemore said recently. Eager to save what money it can, NASA is debating whether to send Discovery to California in September for rigorous inspections and 50 modifications. Given a \$1 billion cut anticipated for the shuttle program during the next five years, the agency is hard-pressed to find the funding. The agency may be forced to settle for having engineers look over Discovery at the Cape and make whichever additions they can afford. Dittemore said a decision will be made this month after NASA hears from its safety panel. ["Discovery may miss upgrades," **Florida Today**, August 16, 2001, p 3A.]

AUGUST 16: While Discovery is in orbit, work continues at KSC preparing the other three orbiters for future flights. Scheduled to launch Nov. 29 on mission STS-108, Endeavour is in OPF bay 1. Modifications to the orbiter's environmental and life support system is under way and Endeavour's robot arm is being tested prior to being turned around for flight. Columbia, targeted to launch Jan. 17 on mission STS-109, is in OPF bay 3 where workers are replacing the orbiter's windows no. 2 and no. 1. Also Columbia's payload bay floodlights are being upgraded. Atlantis, targeted to launch Feb. 28 on mission STS-110, is in OPF bay 2. Technicians have completed inspections on the main propulsion system 17-inch quick disconnects. Orbiter maneuvering system pod checks are ongoing and radiator checks are scheduled this week. ["OPF bays hum with flight preparations on orbiter fleet," **KSC Countdown**, August 16, 2001.]

◆ The Russian space tug Zarya, which was launched Nov. 20, 1998, completed the 1000th day in space as the first building block of the International Space Station. [Web posted. (2001). Spacewalk Gets Under Way as New Station Crew Marks 1000th Day in Space for Outpost Cornerstone [Online]. Available WWW: <http://www.space.com/> [2001, August 16].]

AUGUST 20: The military and NASA must overcome conflicting missions and a history of frustrations if the two are to cooperate on new space-based weapons and technology, military leaders and analysts say. The issue has come to light as President Bush and Defense Secretary Donald Rumsfeld consider a more aggressive military effort in space. It won't be easy. The Air Force and NASA have quite different goals. "We have a lot of things that we can team up on, but shooting missiles at other countries, that's just not our business," NASA spokesman Jim Cast said. NASA's mission is to push technology to its leading edge. The Air Force, on the other hand, must send airmen into battle with proven technologies. "Where it goes, I don't know," Cast said. "We are just in the beginning of this adventure." ["Air Force, NASA are uneasy partners," **Florida Today**, August 21, 2001, p 1A & 3A.]

◆ After living there for five months, the former crew of space station Alpha – Astronaut Susan Helms, Russian Commander Yury Usachev and Astronaut Jim Voss – are aboard Discovery for the trip home. The third team of astronaut and cosmonauts, Expedition Three, include Astronaut Frank Culbertson and Russian cosmonaut Vladimir Dezhurov and Mikhail Tyurin. They are to operate 18 experiments, oversee the addition of a new Russian module next month and make three spacewalks during their tour of duty. Discovery's crew released a small cylinder called Simplesat from the cargo bay. The craft, a 12-inch telescope guided by Global Positioning System satellites, is testing the effectiveness of cheaper satellites. ["Second station crew ends 5-month mission," **Florida Today**, August 21, 2001, p 3A.]

◆ Nobel Prize winners, retired military brass and business executives met Monday to figure out how to stem multibillion-dollar cost overruns at the international space station while maintaining its scientific integrity. To many skeptics, the group's mission is impossible. The group had barely begun work Monday when President Bush's No. 2 budgeter, Sean O'Keefe, sent a stern message: Not another penny will be available to increase the station's budget, as has been the case in the past. The U.S. share of the orbiting lab's budget has ballooned from an estimated \$17.4 billion four years ago to \$30.1 billion. The latest surprise came earlier this year when NASA announced that the station was yet another \$4 billion over budget. The overruns have grown so fast that O'Keefe said the number jumped by \$1 billion between the time the administration testified before Congress earlier this year and the day the hearing transcript was typed. The independent task force, headed by former Martin Marietta chief A. Thomas Young, is charged with shaping the future space station and getting the cost overruns under control. The station is being assembled in space and is the product of a consortium of the United States and 15 other countries. The panel must report back by Nov. 1. ["NASA tries to cut costs, not science," **Orlando Sentinel**, August 21, 2001, p A1 & A7.]

AUGUST 21: The STS-105 crew is scheduled to land at KSC aboard Discovery on Wednesday, Aug. 22, about 12:46 a.m. EDT. They will be bringing home the Expedition Two crew – Yuri Usachev, Susan Helms, and James Voss – who have spent the past five months on the International Space Station. They will also be returning with two tons of trash, equipment and completed experiments, stowed in the MPLM Leonardo. ["Discovery to land at KSC Aug. 22," **KSC Countdown**, August 21, 2001.]

AUGUST 22: Discovery glided smoothly out of a cloudy sky Wednesday afternoon, then lifted its nose and gracefully touched down on Kennedy Space Center's shuttle runway. The flawless landing ended a 12-day mission to space station Alpha for four of the astronauts and wrapped up 167 days in space for the three others. The crew got an extra 90 minutes in space because a bank of stubborn clouds blossomed in the morning, blocking the shuttle's first try. Rain disappeared and the cloud bank evaporated in time for a 2:23 p.m. touchdown. ["Perfect landing ends mission," **Florida Today**, August 23, 2001, p 1B & 2B.]

◆ Contrary to the popular view of John F. Kennedy as a space visionary, the president had little interest in space and strove to put humans on the moon only for its political importance. "I'm not that interested in space," he told NASA chief James Webb late in 1962. Kennedy made the remarks during a White House meeting about the space agency's priorities in late 1962. In the meeting, Kennedy faced off against NASA Administrator James Webb, who pushed for a broader NASA mission. Webb insisted that landing on the moon should be only part of a broad effort by NASA to understand the space environment and its effects on humans. But Kennedy stood firm, telling Webb that the moon landing is NASA's top priority. "This is, whether we like it or not, a race... Everything we do (in space) ought to be tied into getting to the moon ahead of the Russians," Kennedy said. ["Kennedy was not 'interested in space'," **Florida Today**, August 23, 2001, p 1A & 3A.]

◆ Budget problems have sidetracked efforts to strengthen security at Kennedy Space Center despite a major breach last month and ongoing concerns about terrorism. A review of critical government facilities ordered more than a year ago by the Clinton administration included recommendations for \$6.8 million in KSC security improvements. Those improvements – which would amount to only a fraction of NASA's \$14.5 billion budget – have yet to be approved in Washington. Meanwhile, base security contractor Space Gateway Support eliminated 21 jobs in a cost-cutting move last month. The cuts reduced the uniformed force guarding KSC and the

adjacent Cape Canaveral Air Force Station to about 360 officers. KSC's vulnerability became clear July 6, before the layoffs took effect. Fifteen Chinese refugees and a Jamaican guide came ashore under cover of darkness and spent several hours undetected on a beach less than three miles south of a shuttle launch pad. The coming months could hold even greater security challenges. NASA Administrator Dan Goldin visited Israel last week to sign an agreement finalizing the launch of that country's first astronaut. Israeli Air Force Col. Ilan Ramon, a 47-year-old former combat pilot, is scheduled to lift off aboard shuttle Columbia on May 23. High-profile missions and visitors are nothing new for KSC. For now, KSC security forces will have to combat potential threats with fewer officers and a relatively flat budget. KSC will spend about \$15 million in fiscal year 2001 on security operations and staff. ["Securing the Cape," **Orlando Sentinel**, August 23, 2001, p A1 & A10.]

◆ The launch of Kodiak Star aboard a Lockheed Martin Athena 1 launch vehicle from Alaska's Kodiak Launch Complex is scheduled for Monday, Sept. 17 at the opening of a launch window that extends from 5 – 7 p.m. ADT (9 – 11 p.m. EDT). This will be the first mission to be launched into an earth orbit from Kodiak Island. Riding atop the Athena 1, the Kodiak Star payload consists of four individual satellites. Starshire 3, whose ride into space is sponsored by NASA, consists of over 1,500 hand-polished mirrors, 31 retro-reflectors and seven clusters of solar cells powering an amateur radio transmitter. The spherical satellite, one meter in diameter and weighing 200 pounds, can be used to study orbital decay. ["Kodiak Star scheduled for launch from Alaska Sept. 17," **NASA News Release #101-01**, August 22, 2001.]

AUGUST 28: Discovery was towed to OPF bay 2 last week to undergo routine post-flight deservicing. Preliminary inspections revealed 106 total debris hits to the orbiter's lower surface, of which 15 measured 1-inch or greater. The orbiter's tiles are reported to be in good condition. Draining of the orbiter's power reactant storage and distribution also occurred. In preparation for STS-108's Nov. 29 launch, last week, technicians completed Endeavour's instrumentation system testing and tested the orbiter's docking mechanism. Water spray boiler checks and payload premate testing also took place. ["Discovery undergoes inspections, while Endeavour prepares for mission STS-108," **KSC Countdown**, August 28, 2001.]

AUGUST 29: Sixteen roofless plastic gazebos dot the land near Kennedy Space Center's Saturn 5 Center. There, researchers with the Smithsonian Environmental Research Center are seeing how increased carbon dioxide in the air could affect native plant life. In some of the structures they have doubled today's level of carbon dioxide to what it might be in 100 years. Carbon dioxide levels in the atmosphere are growing because of coal and oil burning. And greenhouse gases like carbon dioxide may be associated with global warming. Eight of the open-air chambers at KSC are normal greenhouses with waist-high shrubs. In the other eight, the crew pumps in extra carbon dioxide. The CO2 Project began at the space center in 1995. KSC provides the land and buildings. A grant from the U.S. Department of Energy provides the project with \$2 million for three years. ["NASA studies effect of more CO2," **Florida Today**, August 30, 2001, p 1A & 2A.]

AUGUST 30: NASA gave its prime contractor at Kennedy Space Center the go-ahead Thursday to hire hundreds of new workers so they can be trained to perform a multi-million dollar overhaul on shuttle Discovery. And while a decision on exactly where the tune-up will be conducted still is pending, the move could signal a cross-country switch for work that originally was to be done at a shuttle assembly plant located in California's Mojave Desert. The work package still "could go to either place," said Jack King, a spokesman for United Space Alliance, the company that carries out day-to-day shuttle operations for NASA at the agency's coastal Florida spaceport. NASA periodically sidelines one of its four winged orbiters for extensive structural inspections

and modifications, leaving its three other ships to carry out shuttle missions in the meantime. That work traditionally is done at a Boeing plant in Palmdale, Calif. The agency, however, is facing an \$800 million shuttle budget shortfall over the next five years. So senior NASA managers are considering moving planned overhaul work on Discovery here to KSC in an effort to save money. A firm decision on where the work will be done is to be made in mid-September. [Web posted. (2001). New Florida Hires OK'd for Shuttle Work Normally Done in California [Online]. Available WWW: <http://www.space.com/> [2001, August 30].]

DURING AUGUST: James R. Heald has been named director of the Spaceport Engineering and Technology organization at Kennedy Space Center (KSC). In this position, Heald is responsible for leading the center's efforts for integrated engineering and spaceport technology development. Also, he will lead KSC's spaceport engineering and technology organizational efforts in building KSC into a premier spaceport science and engineering organization. ["James R. Heald named KSC director, spaceport engineering and technology," Brevard Technical Journal, August 2001, p 4.]

SEPTEMBER 2001

SEPTEMBER 2: George M. Skurla, who led final checkout of NASA/Grumman lunar modules for the initial Apollo mission and became president of the Grumman Corp., died Sept. 2 at Melbourne, Fla., hospital of complications from a respiratory infection. He was 80. In 1965, Skurla was named director of Grumman operations at Kennedy Space Center, where he led the 1,600-member team that conducted final assembly and test of the Apollo lunar modules for the initial manned landings on the Moon. ["Obituary," Aviation Week & Space Technology, September 10, 2001, p 25.]

SEPTEMBER 5: The Air Force hopes modern computers and a new communications network will reduce the Range's workforce by at least 60 positions. It also hopes to save money for itself and the companies that use the launch site. Air Force officials said the cost of the upgrade was more than \$2 billion through 2006. But those officials won't say how much savings to expect. However, it should make the U.S. launch business more competitive. The work, which has shut down the Eastern Range until Sept. 21, is centered on the critical safety network that ground controllers use to blow up careening rockets before they threaten space coast communities. Other systems will be replaced over several years of upgrades at the base. ["Air Force upgrades launch facility," Florida Today, September 6, 2001, p 6A.]

SEPTEMBER 6: Recommendations from a detailed NASA study to be completed in November could reshape the way NASA handles its highest-profile programs. Houston's Johnson Space Center, home to astronaut training and Mission Control, could be the hardest hit as the officials decide how much equipment is needed to run the shuttle and station programs and train the astronauts. A re-organization there could shift more jobs to Kennedy Space Center if NASA opts to consolidate its shuttle and station workforce. Aerospace contractors already have begun similar planning. The review is part of a NASA-wide evaluation of the space station program. Control of the \$25 billion development project was moved from Houston to NASA Headquarters in Washington, D.C., in February when the costs spiraled higher. The NASA appointed team held its first meeting Aug. 21 and plans to fan out to evaluate the space station program in the next several weeks. "They're looking at all the centers, all of the assets," Johnson Space Center spokeswoman Eileen Hawley said Thursday. There is no word on when investigators will look into Kennedy Space Center's role in the program. ["Space budget cuts will hit Houston hard," Florida Today, September 7, 2001, p 8A.]

◆ The U.S. Air Force has decided against resurrecting the troubled X-33 space plane abandoned by NASA in March. Prime contractor Lockheed Martin confirmed Thursday that an Air Force Space Command proposal to finish the experimental launcher was rejected last week by the Pentagon. The decision makes it unlikely X-33 will ever leave the ground, even though the ship is 75 percent complete after a combined NASA and industry investment of almost \$1.3 billion. Defense Department managers were concerned that the cost of finishing the program was too great, and it was unclear whether X-33 would fill any current Air Force requirements. NASA reached a similar conclusion on cost in March. Lockheed Martin had been working since 1996 to build the pilotless X-33 prototype in an effort to develop a successor to NASA's space shuttle. ["Air Force decides not to revive Lockheed's X-33 space plane," Orlando Sentinel, September 7, 2001, p A5.]

SEPTEMBER 11: On September 11, four U.S. planes hijacked by terrorists crashed in New York, Washington and Pennsylvania killing more than 3,000 people in a matter of hours. ["If you want to humble an empire," Time, September 11, 2001.]

◆ NASA's Kennedy Space Center was shut down Tuesday and placed under the highest state of emergency readiness. It was the first time in the center's 39-year history that the security level known as Threat Condition Delta had been ordered. National Aeronautics and Space Administration managers said no specific threats were made against KSC. However, to be safe in the wake of terrorist attacks elsewhere, facilities around the center were closed. Government and contract workers were sent home. "This is a very serious situation in terms of national security," KSC spokesman Joel Wells said. "We have a fleet of national assets and 12,000 employees here at Kennedy. Ensuring their safety and security is our top priority." Throughout the day, helicopters could be seen hovering around key facilities, including the hangars where the shuttle fleet is kept. All four orbiters – Columbia, Discovery, Atlantis and Endeavour – are housed at KSC. Security was beefed up at KSC entrances, and checkpoints were set up at other locations. Additional security patrols were added. The KSC Visitor Complex was shut down. NASA centers in other parts of the country, including the agency's headquarters in Washington, also were shuttered. Workers at Johnson Space Center in Houston were sent home except for a skeleton crew in Mission Control needed to monitor the crew aboard the international space station. ["NASA scrambles to protect personnel, fleet of space shuttles," Orlando Sentinel, September 12, 2001, p A3.]

SEPTEMBER 12: Security police kept their vigil at Kennedy Space Center on Wednesday while NASA made plans to re-open the space center Thursday. The facility remained at a high level of security, meaning there will be inspections of some cars and trucks. NASA advised its workers to arrive early and expect delays at the gates. The KSC Visitor Complex will remain closed. There is no word when it may reopen. There were no specific threats to either, NASA spokesman Bill Johnson said. NASA postponed Monday's launch of four small satellites from Kodiak Island in Alaska by at least two days. Officials from KSC will control the launch, the first from Alaska to send spacecraft in orbit. Terrorism experts are divided on how much risk KSC faces. But they agreed it would be irresponsible for NASA not to take the utmost precautions. ["KSC will reopen today for staff," Florida Today, September 13, 2001, p 13A.]

◆ Patrick Air Force Base and Cape Canaveral Air Force Station remained on high alert Wednesday following Tuesday's terrorist attacks in New York City and Washington, D. C., despite comments from the White House indicating the threat of another attack has declined. All gates to Patrick on State Road A1A remained closed. Only certain workers, like security and people working to prepare for the Oct. 10 launch of an Atlas 2AS rocket with a satellite for the National Reconnaissance Office, will report for duty Thursday. ["Military stands by to protect, retaliate," Florida Today, September 13, 2001, p 13A.]

◆ President George W. Bush declared war on terrorism. Congressional leaders agreed to a \$20 billion emergency relief package in the wake of the deadliest terrorist attack on U.S. soil, the chairman of the House Appropriations Committee said. European allies, meanwhile, gave their backing to an anticipated military response. NATO declared that the attacks could be considered an assault on the whole alliance. ["Bush declares war on terrorism," Orlando Sentinel, September 13, 2001, p A13.]

SEPTEMBER 13: Kennedy Space Center reopened slowly Thursday morning amid intensive identification checks and random searches of trucks and mini-vans. Space center guards scrutinized each badge in the morning drizzle. Instead of relying on discreetly holstered pistols, the men and women kept their submachine guns ready, the black shapes standing out starkly against yellow rain coats. Officials would not suggest how long it would be until the center's normal security level returns, if ever. "This is basically the day after," Kennedy Space Center

spokesman Bill Johnson said. "Right now we're in a period of mourning and it's too early to tell if life will change." The white NASA helicopter that normally shepherds astronaut convoys continued circling the Vehicle Assembly Building and twin shuttle launch pads in a routine turned common since Tuesday's terrorist attacks in New York and Washington. ["Security measures slow KSC traffic," **Florida Today**, September 14, 2001, p 8A.]

SEPTEMBER 16: Kennedy Space Center Visitor Complex will reopen to the public effective Sunday, September 16, 2001 at 9 a.m. The KSC Tour will not be offered at this time. The Visitor Complex was closed shortly after 12 p.m. on Tuesday, September 11, 2001, due to NASA requirements. ["Kennedy Space Center Visitor Complex Reopens to the Public Sunday, September 16, 2001," **KSC-VC Press Release**, September 16, 2001.]

SEPTEMBER 17: Kennedy Space Center's director has called for a series of studies that could fundamentally change how the base operates and who controls it. NASA wants to share the expense of space research with universities and aerospace contractors in order to cope with a flat budget and persistent cost overruns. The agency spends about \$14.5 billion a year. The shuttle fleet faces a \$1 billion shortage over several years starting in 2003, estimates show. President Bush ordered the agency earlier this year to look at ways to hand over operations to private companies. These new studies could redefine the way business is done at Kennedy Space Center, and help the center meet projected budget shortfalls in the coming years. Center Director Roy Bridges outlines a series of studies to find cheaper ways to run NASA's primary launch site. NASA and the Air Force potentially could lease the site for shuttle and rocket launches. Other studies include privatizing the shuttle fleet and increasing partnerships with universities to handle research work from shuttle and space station missions. There is no word yet on when the studies may be finished or whether the proposals will be implemented. The proposals were discussed during a strategy session last week with Kennedy Space Center's top management. The group returned from a retreat in Vero Beach on Tuesday after terrorist attacks in New York and Washington, D.C. ["Private firms my help run KSC," **Florida Today**, September 18, 2001, p 1B & 2B.]

SEPTEMBER 18: The tour buses at Kennedy Space Center's Visitor Complex resumed service on a limited schedule and to smaller crowds Tuesday. The complex closed last week in response to the attacks on New York and Washington, D.C. The bus tours take visitors to several sites where shuttles are assembled and launched, as well as the building where parts of the International Space Station are built. "The buses are only stopping at the Apollo/Saturn 5 Center after circling the Vehicle Assembly Building," said Michelle Salyer, public relations manager for the complex. Attendance was down Tuesday, Salyer said without elaborating on exact numbers. Along with a reduced tour schedule, visitors also faced heightened security. Signs in front of ticket booths asked people to leave backpacks, coolers and suitcases in their cars. As guests trickled through ticket counters, they were greeted by guards in bright orange vests. The guards checked video cameras, pages and cellular phones. After the check, guards waved metal detector wands over each person before they were allowed to pass through the turnstiles. ["KSC visitors see tighter security, fewer sights," **Florida Today**, September 19, 2001, p 4B.]

SEPTEMBER 20: NASA and the United Space Alliance have signed a \$62 million modification to the Space Flight Operations Contract to provide refurbishment of hydraulic actuators on the space shuttle fleet during the next five years. The work, which is planned during regularly scheduled future shuttle maintenance periods, will involve the complete refurbishment of the 11 hydraulic actuators on each space shuttle orbiter. The actuators move the vehicle's rudder, speed brake, elevons and main engines during flight. Endeavour will be the first shuttle to have the refurbished actuators installed during its next maintenance period, planned to begin in

2003. The work will be performed at locations including East Aurora, N.Y.; Palmdale and Huntington Beach, Calif.; and the Kennedy Space Center, Fla. ["NASA, USA sign \$62 million space flight operations contract modification," **NASA News Release #c01-t**, September 20, 2001.]

SEPTEMBER 21: The Kennedy Space Center Visitor Complex was forced to lay off 42 of its 101 staff members Friday after being closed for almost a week after the Sept. 11 terrorist attacks. Technically, the layoff is for 90 days, said Dan LeBlanc, spokesman for the complex, but it easily could turn into a permanent action should tourism fail to bounce back quickly. Attendance has been down about 60 percent at the complex since it reopened. ["KSC attraction lays off 42," **Florida Today**, September 22, 2001, p 1A.]

SEPTEMBER 24: A state panel is making a road trip to Brevard to decide the fate of the aging Max Brewer Causeway – a critical space center evacuation route. Rep. Randy Johnson, R-Celebration, is bringing the House Transportation Appropriations Committee to Titusville today to discuss funding to rebuild the 52-year-old swing-bridge that provides access to Kennedy Space Center, Canaveral National Seashore and the Merritt Island National Wildlife Refuge. KSC Director Roy Bridges is expected to testify the bridge is critical to national security and daily space center operations. "We're trying to fit it under the Space Transportation Act, which requires infrastructure to the space center to be built," said Rep. Bob Allen, R-Merritt Island. "The problem is we're trying to get going on this before it falls in the water." The bridge from Titusville to Merritt Island was built in 1949 with a 50-year lifespan, Allen said. ["State panel to discuss fate of KSC bridge," **Florida Today**, September 25, 2001, p 2B.]

SEPTEMBER 25: Main engine installation on Endeavour began Sept. 24. Technicians continue installation of an enhanced monoball wiring harness that will improve processing efficiency. Endeavour is still targeted for launch Nov. 29. Columbia's left-hand OMS pod and forward reaction control system are being installed this week. The payload bay doors on Atlantis are open and technicians are working on the orbiter's midbody. Discovery remains in temporary storage. ["Work continues on Shuttles for future missions," **KSC Countdown**, September 25, 2001.]

◆ The launch of the Kodiak Star spacecraft from the Kodiak Island Launch Complex, Alaska, has been postponed pending evaluation of solar flare activity. The payloads aboard include the Starshine 3, sponsored by NASA, and the PICOSat, PCSat and Sapphire, sponsored by the Department of Defense (DoD) Space Test Program. ["Kodiak Star Mission Delayed," **KSC Countdown**, September 25, 2001.]

◆ Two ELV launches are scheduled for October/November. HESSI is listed as NET Oct. 18 via the Pegasus XL/Lockheed L-1011. It is a NASA/Orbital Sciences government civil launch. The second is the TDRS-I on an Atlas II. It was a NASA/Lockheed Martin government civil launch. ["ELV launches at CCAFS," **KSC Countdown**, September 25, 2001.]

SEPTEMBER 27: The launch of Kodiak Star for NASA and the Department of Defense on a Lockheed Martin Athena I vehicle was postponed Tuesday for an additional 48 hours. The effects of Monday's morning's solar flare continued to increase in intensity throughout the day. Space weather experts believe that based on historical data for a solar flare of this magnitude, it would require approximately 3.5 days after the solar flare reaches its peak before the level of "proton flux" would decrease to allowable launch criteria for the Athena I. Based on this information, launch is now planned for no earlier than Thursday, Sept. 27 at 5:30 p.m. ADT (9:30 p.m. EDT). ["Kodiak Star launch rescheduled NET Sept. 27 due to solar flare activity," **KSC Countdown**, September 27, 2001.]

SEPTEMBER 28: NASA discovered misshapen holes in the two orbital-engine compartments intended for space shuttle Columbia, which is being readied for a flight to the Hubble Space Telescope early next year. NASA spokesman James Hartsfield said Friday that the holes were in one of 12 attachment points for the pods that hold the orbiter maneuvering system. Engineers believe the holes were marred by machining, but do not know when. Hartsfield said engineers are trying to determine whether misshapen holes might weaken the spot where the pod attaches to the aft fuselage of the shuttle. These hold 5/16th inch bolts. The holes already have been fixed on Columbia, but it's not known whether any of the three other shuttles might have the same problem, Hartsfield said. [Web posted. (2001). Deformed Holes Found on Shuttle [Online]. Available WWW: <http://www.washingtonpost.com/> [2001, September 28].]

SEPTEMBER 29: Lockheed Martin's Athena 1 launch vehicle successfully launched the first Kodiak Star Mission at 10:40 p.m. EDT. This was the first launch from the new Kodiak Launch Complex on Kodiak Island in Alaska. The Kodiak Star Mission carried four satellites into Earth orbit. Three of the satellites were provided by the Department of Defense Space Test Program (STP); PICOSat, PCSat and Sapphire. The fourth satellite is the NASA-sponsored Starshine 3. [Web posted. (2001). Kodiak Star Mission Launch Successful [Online]. Available WWW: <http://www.spaceref.com/> [2001, September 29].]

OCTOBER 2001

OCTOBER 1: The Coast Guard established a security zone Monday around Cape Canaveral Air Force Station and Kennedy Space Center to protect the space shuttles and launch pads from an attack by boat. Boaters will be barred from an area that begins in Port Canaveral, ends at the Haulover Canal and extends three nautical miles into the Atlantic Ocean until at least Oct. 31. The secure area also includes the southern end of Mosquito Lagoon and part of the Indian River. The zone is part of Patrick Air Force Base's increased security measures since the Sept. 11 attacks on the World Trade Center and the Pentagon. At the end of the month, the Coast Guard will re-evaluate security to see whether the zone should be lifted. In the meantime, boaters found in the area could be jailed or fined as much as \$50,000. ["Cape area off-limits to boaters," Florida Today, October 2, 2001, p 1A.]

◆ NASA won't have to pay the price for increased security measures in the wake of terror attacks in New York and Washington, D.C., Sen. Bill Nelson said Monday. Nor should the space agency have to cut its own spending to cover the costs of the upcoming war, he said. Instead, the money will come from the \$40 billion Congress recently approved for anti-terrorism measures, he said. The new emphasis on guarding the space coast's government installation also could mean rehiring 16 employees recently laid-off by Space Gateway Support, which handles security at Kennedy Space Center and Cape Canaveral Air Force Station under a contract with NASA and the Air Force. The Air Force and other service branches supplement the contractor at times. "Anytime you have a major symbol of America, you have to guard it," Nelson, D-Melbourne, told reports following a 2 ½ hour meeting with Kennedy Space Center Director Roy Bridges and 45th space Wing Commander Gen. Donald Pettit. Nelson was in town to discuss security. ["NASA won't pay for added security," Florida Today, October 2, 2001, p 2A.]

◆ The International Space Station's crew might be forced to stay in space for several extra weeks if orbital maneuvering engines on shuttle Endeavour have to be removed for special safety inspections, NASA officials said Monday. Seven shuttle flights in 2002, meanwhile, face launch delays of two weeks to a month because of extra work that needs to be done on shuttle Columbia, which is being readied for a return to flight after a lengthy overhaul in California. In space since August, the station's crew – U.S. astronaut Frank Culbertson and Russian cosmonauts Vladimir Dezhurov and Mikhail Tyurin – remain scheduled to return to Earth on Dec. 10 aboard Endeavour. However, that plan could change if NASA engineers determine that the ship's two hump-like orbital maneuvering system pods must be removed for extra inspections. Engineers inspecting Columbia discovered a problem with one of the 12 attachment points for the shuttle's twin orbital maneuvering engines, which are housed in pods on either side of the ship's vertical stabilizer, or tail fin. ["ISS crew faces extended stay," Florida Today, October 2, 2001, p 1B.]

OCTOBER 2: Space Gateway Support has rehired 16 laid-off security guards and could grow by another 50 at Kennedy Space Center and Cape Canaveral Air Force Station in the wake of terrorist attacks in New York and Washington, D.C. SGS spokesman Sam Gutierrez confirmed that a cadre of guards laid off in July have returned to the force. New hires would be made as the company takes steps to further safeguard \$8 billion worth of shuttles from potential dangers. NASA's new security director, David Saleeba, is expected to recommend safety changes soon at all of the agency's field centers, said NASA spokesman Bob Jacobs. Saleeba was appointed Aug. 20, three weeks before the attacks. Sen. Bill Nelson said on Monday the government will spend enough to protect all of its installations, including the 140,000 acres of Kennedy Space Center and 15,000 acres of the Air Force Station. [Web posted. (2001). Space Gateway Support to add

to its police force at Cape [Online]. Available WWW: <http://www.floridatoday.com/> [2001, October 3].]

◆ Boeing Co. said on Tuesday that a crane operator died late Monday in an accident at its space launch facility, Launch Pad 37, at Cape Canaveral, Florida. Chicago-based Boeing said Bill Brooks, 47, a 10-year Boeing employee, had been performing regular monthly maintenance on a mobile tower crane when he was killed in an accident, but provided no other details. [Web posted. (2001) Accident kills Boeing crane operator [Online]. Available WWW: <http://biz.yahoo.com/> [2001, October 2]. Web posted. (2001) Crane Accident Kills Boeing Worker at Cape [Online]. Available WWW: <http://www.space.com/> [2001, October 3].]

OCTOBER 5: Space shuttle Endeavour remains on track for a launch next month, despite misshapen bolt holes found in another shuttle. After a week of tests, NASA concluded Friday there is no need to remove Endeavour's two orbital-maneuvering system compartments for inspection and that the shuttle is safe to lift off November 29 as planned. Endeavour will deliver a new crew to the international space station. Columbia's flight to the Hubble Space Telescope, meanwhile, has been bumped from January to February because of shuttle maintenance work. [Web posted. (2001) Holes won't hold up shuttle launch [Online]. Available WWW: <http://www.cnn.com/> [2001, October 6].]

OCTOBER 8: Two Russian cosmonauts from the Expedition Three crew aboard the International Space Station performed a 5 hour spacewalk Monday. This spacewalk marked the first time that a spacewalk has been performed from the ISS without the presence of a Space Shuttle orbiter. It was also the 100th spacewalk performed by cosmonauts since the first EVA (by anyone) was performed by Alexi Leonov in 1965. [Web posted. (2001). Space Station EVA Performed Without Space Shuttle Present [Online]. Available WWW: <http://www.spaceref.com/> [2001, October 8].]

OCTOBER 9: Unveiled to the theme from the motion picture "The Right Stuff," Boeing today dedicated its new Space Launch Complex (SLC) 37 facility at Cape Canaveral Air Force Station. The new SLC-37 facility will process and launch all five variants of the Delta IV family that includes the Delta IV Medium, three versions of the Delta IV Medium+, and the Delta IV Heavy. SLC-37 includes the launch pad, Delta IV Horizontal Integration Facility, Operations Center and Logistics Operations buildings. [Web posted. (2001). Boeing Dedicates New Delta IV Launch Complex at Cape Canaveral [Online]. Available WWW: <http://www.spaceref.com/> [2001, October 9].]

◆ Lockheed Martin Space Operations announced that its Consolidated Space Operations Contract (CSOC) has successfully assumed responsibility for the Kennedy Data Network (KDN) at Kennedy Space Center (KSC), Florida. This transfer of authority to CSOC was the first phase of CSOC's Option 3, which consolidates the KSC communications infrastructure for the NASA KSC Spaceport Services (TA) organization. NASA chose to exercise Option 3 because of its anticipated cost savings to the Agency. In addition to taking over the Kennedy Data Network (KDN), Phase 1 includes Channel 60 (cable) support, maintenance of hand-held radios, and the maintenance of engineering and system hardware on the page and area warning system in the KSC Industrial Area. ["Lockheed Martin's CSOC Option Goes On-Line at Kennedy Space Center," **Lockheed Martin Press Release**, October 9, 2001.]

◆ Gov. Jeb Bush is willing to protect a research lab at the Kennedy Space Center from state budget cuts, a lawmaker says. Rep. Bob Allen, R-Merritt Island, said Bush gave him the guarantee to protect the Space Experiment, Research and Processing Laboratory, dubbed SERPL,

at a meeting Tuesday at the Capitol. Florida lawmakers two years ago committed to spend \$30 million over two years as its share of the space research lab. Lawmakers last year approved \$14 million and another \$16 million was appropriated last spring, but the construction money has yet to be spent. The SERPL project's funding was endangered with a looming budget deficit expected to top \$1.3 billion by the time state economists meet next week, and legislators waiting to be called into special session later this month to levy cuts equally deep. Allen said the one-time appropriation is not the kind of cut that Bush wants. He said the governor is looking to shave recurring costs. ["Jeb adamant about protecting KSC research lab from cuts," **Florida Today**, October 10, 2001, p 3B.]

OCTOBER 11: NASA might extend construction time of the International Space Station in overcoming a \$4.8 billion cost overrun, a Kennedy Space Center manager told a conference Thursday. The space agency's schedule calls for station completion as early as 2006. Stretching out the remaining work saves NASA money in its annual budget, but could increase the final costs. "We still have a \$2.5 billion problem to solve," said William Dowdell, head of Mission Managers at KSC. Dowdell filled in during the American Society for Quality session for Space Station Program Manager Tommy Holloway who was called to NASA Headquarters. White House-imposed project cuts shaved \$2 billion and several modules from the outpost. That leaves the station enough room for three crewmembers instead of seven. NASA has been hoping to beg or borrow funding or work from other nations to finish the station. A committee led by former Martin Marietta Chief Executive Officer Thomas Young is examining the cost overrun and how NASA might overcome it. His report is due Nov. 1. ["NASA might extend construction of International Space Station," **Florida Today**, October 12, 2001, p 2A.]

OCTOBER 12: NASA may do away with popular car passes, which allowed resident and tourists to view shuttle launches from the NASA Causeway, officials said Friday. Some security officials worry about letting thousands of unattended visitors close to the launch pads. The grassy causeway is less than 10 miles away from the shuttle launch site. The agency is considering security concerns for the Nov. 29 mission of shuttle Endeavour to space station Alpha. NASA and the Air Force have been working together to tighten security at Kennedy Space Center and Cape Canaveral Air Force Station since the terrorist attacks on Sept. 11. . . . NASA still will issue VIP passes for agency guests. Kennedy Space Center Visitor Complex officials have not been told yet whether to stop selling its own tickets to the causeway. The center buses its passengers to the stands on the causeway. ["Security concerns could put end to NASA Causeway car passes," **Florida Today**, October 13, 2001, p 4A.]

OCTOBER 13: Wearing a "Keep Space for Peace" T-shirt, Miriam Welly Elliott drove to Brevard County on Saturday to join a peaceful protest against the use of weapons in space. Although the excitement and magic of the space program is still there in the shuttle launches, she said, today's space program is "being polluted by a military agenda" – specifically, the missile defense program known as "Star Wars" or the Strategic Defense Initiative, which still is under development. The goal of this program is to find ways to destroy missiles in space before they reach their targets in the United States. But Elliott and some 40 other protesters at the Kennedy Space Center Visitor Complex said the "Star Wars" program will lead to a final arms race between nationals, while doing nothing to impede terrorism. The protestors came from several groups: The Global Network Against Weapons and Nuclear Power in Space, the Florida Coalition for Peace and Justice, Pax Christi Florida and the Green Party of Brevard. ["40 protest space warfare," **Florida Today**, October 14, 2001, p 1B.]

OCTOBER 16: Former Shuttle commanders Robert L. "Bob" Crippen, Joe H. Engle, Richard H. "Dick" Truly and Frederick H. "Rick" Hauck are America's first class of Space Shuttle

astronauts being inducted into the U.S. Astronaut Hall of Fame, joining space heroes from Mercury, Gemini, Apollo and Skylab missions. The induction ceremony will take place on Saturday, Nov. 10, at the KSC Visitor Complex. ["Astronaut Hall of Fame Adds Four," **KSC Countdown**, October 16, 2001.]

◆ Joseph H. Rothenberg, Associate Administrator for Space Flight at NASA headquarters in Washington, today announced his plans to retire from the Agency, effective December 15. No successor has been selected. As Associate Administrator, Rothenberg is responsible for establishing policies and direction for the Space Shuttle and International Space Station programs, as well as for space communications and expendable launch services. In addition, he is responsible for the operation and oversight of NASA's Johnson Space Center in Houston, NASA's Kennedy Space Center in Florida, NASA's Stennis Space Center in Mississippi and NASA's Marshall Space Flight Center in Alabama. ["Joseph H. Rothenberg, Associate Administrator For Space Flight, Announces Retirement," **NASA News Release #01-199**, October 16, 2001.]

◆ A rapidly proliferating national anthrax alert rippled across NASA's Kennedy Space Center Tuesday as mailrooms in five buildings were evacuated after employees discovered white powder and parcels laced with suspicious substances. NASA officials said that preliminary analysis showed that none of the substances appeared to be hazardous, but at least some of the packages and the trousers of a worker were taken to a state laboratory in Jacksonville, Fla., by two FBI agents and a KSC surgeon. An undisclosed number of mail handlers and other workers, however, were given medical examinations. The surge of KSC reports began about mid-morning Tuesday at a building in which parts of shuttle solid rocket boosters are assembled and then refurbished after flight. An unidentified mail handler at the so-called Assembly and Refurbishment Facility noticed during the course of normal work that white powder was covering his or her trousers. The mailroom at the KSC headquarters building then was evacuated and inspected because pieces of mail the worker handled had originally come from there. Then, over the course of the day, reports came in from three other NASA buildings here, including the Space Station Processing Facility, where components for the International Space Station are readied for flight. "Immediate steps were taken to isolate the materials and the areas where the workers had been," said KSC spokesman Joel Wells. A substance on a piece of mail at ISS processing building was quickly determined to be "benign," NASA officials said, but then a yellow powder and a brown substance were discovered on parcels in the mailrooms of two office buildings in the Launch Complex 39 area here. The mailrooms in four of the five buildings had been fully inspected and reopened by the end of normal business. Assuming no evidence of anthrax or any other biological agent is found, the mailroom in the fifth building is expected to reopen by Wednesday morning. [Web posted. (2001). Anthrax Scare Hits NASA's KSC; Five Mailrooms Evacuated [Online]. Available WWW: <http://www.space.com/> [2001, October 16].]

OCTOBER 17: After nearly ten years as the head of America's space program, NASA's longest-serving Administrator, Daniel S. Goldin, today announced his resignation, effective November 17. "For nearly a decade, it has been my honor to serve the American people by leading our Nation's space program and its dedicated personnel," Administrator Goldin said in a letter to President George W. Bush. While no replacement has been selected, Administrator Goldin will work with the Administration before he leaves office to identify an interim Acting Administrator. ["NASA Administrator Daniel S. Goldin Announces resignation," **NASA News Release #01-191**, October 17, 2001.]

◆ An additional \$93.1 million is proposed for NASA in order to maintain a heightened state of security at 10 field centers and at NASA headquarters in FY 2002. These funds will provide

resources for the costs of: additional security personnel and overtime compensation; modifications to security perimeters; construction of additional checkpoints; additional security monitoring and communications equipment; relocation of critical functions and personnel; and increased air and sea patrols at the Kennedy Space Center in Florida. [Web posted. (2001). Letter From The Director of OMB To The President On Emergency Funding Request [Online]. Available WWW: <http://www.spaceref.com/> [2001, October 17].]

OCTOBER 18: Endeavour's payload bay doors have been closed for rollover to the VAB next week. Endeavour will be launched on mission STS-108 – a utilization flight to the International Space Station – Nov. 29. Columbia: Alignment work on the heads-up display has been completed and PAU leak checks are under way. Columbia is scheduled to launch Feb. 14, 2002, on a Hubble Space telescope service mission. Atlantis: Upgrading of the mass memory units is ongoing and technicians are replacing window no.7. The orbiter is scheduled for another Space Station assembly mission to launch March 21, 2002. Discovery: It remains in temporary storage. ["Orbiter processing continues for next three launches," **KSC Countdown**, October 18, 2001.]

OCTOBER 23: Hubble Space Telescope (HST) Servicing Mission (SM) 3B payload elements are being processed in the Vertical Processing Facility for launch on STS-109. Due to HST's highly contamination sensitive nature, the HST SM3B Contamination Control Working Group has published a list of limits and restrictions to operations. ["Hubble equipment being prepped for STS-109 mission," **KSC Countdown**, October 23, 2001.]

OCTOBER 24: Under tight security, the first orbiter to go into space since the Sept. 11 terrorist attacks made its first move toward launch Wednesday. The 110-ton shuttle Endeavour was carried from its hangar to the Vehicle Assembly Building where it will be hoisted overnight and bolted to the side of a set of solid-fueled booster rockets and an external tank. The stack will roll to the launch pad sometime next week. Launch is scheduled for Nov. 29 at 8:05 p.m. NASA allowed only agency photographers to record Wednesday's rollover. The attacks did not delay the move or the launch, but Endeavour's 20 minutes outside marked the first time a shuttle has been allowed into an open area since Sept. 11. Kennedy Space Center has been at its second-highest protection level since the attacks. "There was adequate and appropriate security," Kennedy Space Center spokesman Bruce Buckingham said. The Coast guard and Air Force are expected to continue intensive patrols of the airspace and ocean near the launch complex as launch day approaches. Endeavour will carry a replacement crew to space station Alpha and return with the three men living aboard the outpost. ["Mission gains significance," **Florida Today**, October 25, 2001, p 1B.]

OCTOBER 26: Guenter Wendt, former long-time KSC employee, will sign copies of his new book, *The Unbroken Chain*, at the Kennedy Space Center Visitor Complex on Nov. 10. The event is part of a weekend celebration in which four Shuttle commanders will be inducted into the U.S. Astronaut Hall of Fame. [Web posted. (2001). Protecting Cape Launch Pads at Height of Cold War [Online]. Available WWW: <http://www.space.com/> [2001, October 26].]

◆ The International Space Station marked one full year of continuous human habitation. Named Alpha by its first crew, the station started out at 70 tons. It now weighs 150 tons, making it about the size of a three-bedroom house. The station, which orbits at about 250 statute miles above the surface of Earth, has hosted three crews, four American astronauts and five Russian cosmonauts. Fourteen spacecraft have docked and departed from Alpha, ferrying 79 visitors from six different nations. [Web posted. (2001). Happy Birthday, Space Station [Online]. Available WWW: <http://www.cnn.com/> [2001, October 26].]

OCTOBER 29: Although the Bush administration asked Congress for \$93.1 million to upgrade security at Kennedy space Center and elsewhere, NASA calculated it needed much more to protect its workforce, facilities, computers and shuttle fleet from terrorists. In a letter to the Office of Management and Budget, NASA officials requested \$400 million to address counter-terrorism and security at nine field centers and its headquarters in Washington, D. C. NASA spokeswoman Debbie Rahn declined to discuss the agency's request or the funding level the budget office offered. "The only thing I can say is we're taking all appropriate measures to protect NASA employees and facilities," she said. The agency's request acknowledged its sprawling centers in Florida, Texas, Alabama and elsewhere are difficult to protect from air, land and even water assault. NASA officials also wanted \$200 million to enhance computer and telephone systems. But budget office officials saw NASA's priorities differently and asked Congress to fund only the "most urgent security and counter-terrorism needs." ["NASA seeks security boost," **Florida Today**, October 31, 2001, p 1A.]

OCTOBER 31: NASA moved space shuttle Endeavour to its launch pad on Wednesday amid high security and unprecedented secrecy. For the first time in the 20-year space shuttle program, NASA did not announce the move from the hangar to the pad in advance. Kennedy Space Center has added extra security since the September 11 terrorist attacks. Even more security will be in place by the time Endeavour is scheduled to launch on November 29. The shuttle will ferry a fresh crew to the international space station. NASA spokesman Bruce Buckingham said Endeavour's trip atop a giant crawler took place in the early morning, lasted seven hours and was uneventful. [Web posted. (2001). Security tight for shuttle rollout [Online]. Available WWW: <http://www.cnn.com/> [2001, October 31].]

◆ A pair of F-15 fighter jets roared over Kennedy Space Center on Wednesday morning as shuttle Endeavour inched toward its launch pad. The Air Force fighters flanked the Vehicle Assembly Building during their first pass about 500 feet above the ground, air-to-air missiles hanging below their wings. They made two laps around the launch pad before igniting afterburners and climbing into the low morning clouds just over the Atlantic Ocean. The aircraft carried the tail markings of a Florida Air National Guard unit. Such units have been taking part in Operation Noble Eagle, flying patrol missions over the United States. An OV-10 light observation aircraft flew lazy circles around Endeavour during most of the shuttle's six-hour move. A NASA helicopter, seen regularly around the base, also scouted the route. ["Tight security safeguards Endeavour's trip to pad," **Florida Today**, November 1, 2001, p 1A.]

DURING OCTOBER: Kennedy Space Center was awarded the prestigious Franklin Covey Team Award for Synergy and Impact for 2001. Center Director Roy Bridges and several members of the KSC Change Leaders Network attended the Franklin Covey 8th Annual International Symposium in Salt Lake City, Utah, in October, to receive the award. Among only six organizations worldwide to receive the award in the category, KSC was cited for its "outstanding effectiveness in the workplace and community." ["KSC honored with prestigious Covey Team Award," **KSC Countdown**, November 20, 2001.]

NOVEMBER 2001

NOVEMBER 1: A group of union workers from the Kennedy Space Center Visitor Complex on Thursday picketed their employer for cutting their work hours since the Sept. 11 terrorist attacks. In addition to losing income, the workers said some are in danger of losing their benefits from having their hours reduced. About 15 workers stood with picket signs for about six hours on State Road 405, several miles from the Visitor Complex, the Space Center's tourist attraction. The workers – who are members of the International Association of Machinists and Aerospace Workers District 166/Local 773 – are employees of Delaware North Parks Services of Spaceport, which has a contract with NASA to manage the Visitor Complex. [“KSC workers picket over work-hour cuts,” **Florida Today**, November 2, 2001, p 1C & 2C.]

NOVEMBER 2: NASA's International Space Station program has lost its credibility and is in need of a major overhaul, a blue ribbon panel of experts reported Friday. If the space agency doesn't correct the program's weaknesses, the orbiting outpost will fall far short of its promised research goals, warned members of the independent panel in a report unveiled at NASA headquarters. The Independent Management and Cost Evaluation Task Force recommended the space agency be put on a two-year probation of sorts to determine whether it can re-establish credible management of the program. To save money, the panel suggested management and operational changes that likely would result in job cuts at NASA space centers and fewer shuttle flights. Thomas Young, the panel's chairman and a former president and chief operations officer of Martin Marietta Corp., declined to speculate on how many jobs would need to be cut. That would be up to NASA to determine, Young said. [“Panel: Station program needs major changes,” **Florida Today**, November 3, 2001, p 1A & 2A.]

NOVEMBER 5: NASA is considering a fundamental overhaul for its shuttle program by turning it over to a private company, according to a preliminary report now being discussed inside the agency. Any changes are not anticipated until 2004 at the earliest, agency spokesman Dwayne Brown said. That is the only tangible date NASA cites for the plan. Shuttle Program Manager Ron Dittmore led a team of NASA and industry officials through a concept plan for handing control of the \$3.1 billion-a-year project over to the private sector. Under the plan publicly released by NASA: *The space agency would be a customer for the orbiter fleet. A private company or organization would operate the spacecraft, potentially selling its services for non-NASA missions. *Astronauts, flight directors and launch controllers would work for the new company instead of under NASA auspices. *NASA would employ a small group of safety officers for the program. *As many as 900 civil servants would move out from NASA. The team that drafted the plan has taken it to NASA centers for critiques during the past month and refuses to speak about the paper. The space agency pursued privatization under orders from the White House. [“NASA-run shuttle may go private,” **Florida Today**, November 6, 2001, p 1A & 2A.]

◆ A flawed mechanism attached to one of shuttle Endeavour's three main engines will be replaced and should not delay the Nov. 29 mission, NASA reported Monday. The actuator device helps steer one of Endeavour's three main engines during launch. The defect was discovered during flight readiness testing Friday. “It's not going to impact any other activities at the pad,” KSC spokesman Bruce Buckingham said. Workers will replace the piece with a similar one from shuttle Discovery, which is scheduled for an overhaul. [“Shuttle part to be replaced,” **Florida Today**, November 6, 2001, p 1B.]

NOVEMBER 6: KSC senior executives were awarded the prestigious Meritorious Executive Presidential Rank Award. The award is presented each year to a small group of career senior

executives within the federal government who demonstrate strength in leadership and a personal commitment to excellence in public service. KSC recipients include Roy D. Bridges Jr., Center Director; Larry C. Ellis, acting deputy director, International Space Station and Payload Processing; James E. Hattaway Jr., director, Procurement Office; David A. King, director, Shuttle Processing; John J. (Tip) Talone Jr., director, International Space Station and Payload Processing. Awardees were nominated by NASA Administrator Daniel S. Goldin, reviewed and evaluated by a panel of private citizens and approved by the president. ["CD Bridges and other KSC executives receive awards for leadership, excellence," **KSC Countdown**, November 6, 2001.]

◆ An Apache helicopter gunship and cadre of machine gun-toting guards watched over a team of astronauts Tuesday as they flew in for a practice countdown. The four shuttle astronauts and the fourth group of International Space Station residents are to ride Endeavour into orbit Nov. 29 from Kennedy Space Center on an 11-day mission. The astronauts, led by Commander Dominic Gorie, will practice the last hours of countdown and reacquaint themselves with the launch pad escape systems they would use in an emergency. Mark Kelly, Linda Godwin and Daniel Tani round out the crew. ["Astronauts land at KSC for practice countdown," **Florida Today**, November 7, 2001, p 1B.]

NOVEMBER 8: A \$2 billion symbol of American technological prowess, NASA's shuttle Endeavour stands poised on a Kennedy Space Center launch pad, a potential target for a terrorist attack. But even in the wake of September 11, the seven astronauts and cosmonauts destined to launch aboard the ship say they'll be fearless flyers when Endeavour blasts off for the International Space Station later this month. "We are totally confident," Endeavour mission commander Dominic Gorie told reporters here at Kennedy Space Center Thursday. With launch set for Nov. 29, Gorie and his crewmates already have been briefed on extra security measures that have been put in place to protect the shuttle. "I'm not able to talk about any specifics, but we are very, very pleased with everything that's been done for security here," he said. "We're extremely happy with all the hard work that's gone into making this site – and the launch and landing of Endeavour – a safe one." In town this week for a practice countdown, four Endeavour astronauts are scheduled to ferry a fourth full-time crew to the international space station and then return to Earth with the outpost's current tenants. [Web posted. (2001). First Post-Sept. 11 Shuttle Crew Impressed with Extra Security Measures [Online]. Available WWW: <http://www.space.com/> [2001, November 8].]

◆ The STS-108 crew will carry 6,000 small American flags, 23 police badges and 300 New York Fire Department patches into space and back inside Endeavour. NASA will give the flags to the terror victims' families when Endeavour returns from its 11-day mission to space station Alpha. Larger flags from the World Trade Center, Pentagon and Pennsylvania also will make the trip 240 miles above Earth. ["Astronauts honor terror victims," **Florida Today**, November 9, 2001, p 1B & 2B.]

NOVEMBER 10: Four shuttle commanders joined the ranks of Mercury, Gemini and Apollo pioneers in the Astronaut Hall of Fame on Saturday during a ceremony rich with patriotic tunes and space mission tales. Several hundred people gathered around a temporary stage at Kennedy Space Center Visitor Complex to see Robert Crippen, Joe Engle, Richard Truly and Rick Hauck receive gold medals for the occasion as previous recipients looked on. The ceremony included a bald eagle that flew an impromptu circle over the crowd while the astronauts spoke. Several of the birds live on the wilderness expanse of KSC. A committee of former flight directors, journalists and a space historian chose the inductees. ["4 shuttle pioneers inducted into Hall," **Florida Today**, November 11, 2001, p 1A.]

NOVEMBER 14: U.S. President George W. Bush said Wednesday that he planned to name Sean O’Keefe, a top official with his budget office, as the new chief of the National Aeronautics and Space Administration (NASA). O’Keefe is currently the Deputy Director of the White House Office of Management and Budget. Previously he taught at the Syracuse University Maxwell School of Citizenship and Public Affairs. {Web posted. (2001). Bush Appoints Bean Counter In Bid to Salvage NASA From ISS Overruns [Online]. Available WWW: <http://www.spacedaily.com/> [2001, November 14].]

◆ Kennedy Space Center officials hope to buy out 75 civil servants in a bid to shift the work force to critical areas. The center will hire 75 new workers in jobs critical for its launch role. The center employs 1,800 government workers. Most of the base’s efforts to prepare and launch space shuttles are handled by about 12,000 contractor employees who would not be affected by the buyouts. KSC Director Roy Bridges floated the idea in a memo to employees Wednesday in which he laid out his rationale for the move. “As many of you are aware, NASA is facing a number of significant fiscal challenges in the FY 2002 budget year and beyond,” Bridges said. “The International Space Station Program is particularly challenged to reduce costs.” The plan needs approval from NASA Headquarters. “What we’re trying to do is find a way to get the critical skills and we know we’re not going to be able to hire,” spokesman George Diller said. [“KSC chief floats buyout plan,” **Florida Today**, November 15, 2001, p 1A.]

NOVEMBER 15: Processing continues on schedule for the 7:44 p.m. launch of STS-108 on Nov. 29. Verification testing of the newly replaced yaw actuator is under way. The Flight Readiness Review takes place today in the Mission Briefing Room. [“Endeavour preps at pad on track for Nov. 29 liftoff,” **KSC Countdown**, November 15, 2001.]

◆ The annual Harry Kolcum Memorial News and Communications Awards, which honor the late *Aviation Week & Space Technology* managing editor and senior editor at Cape Canaveral, were presented Nov. 15 by the National Space Club’s Florida Committee before about 150 aerospace managers at the Cape. Hugh Harris, who had a 35-year NASA career and served as the “voice of shuttle launch control,” received the public affairs award. [“News Roundup,” **Aviation Week & Space Technology**, November 19, 2001, p 29.]

NOVEMBER 16: Dan Goldin stepped down as Administrator of NASA today. After a short introduction, a standing room only audience at NASA headquarters (and employees across the nation via television) watched a video presentation highlighting the events that shaped “the Goldin Years.” Space icon Walter Cronkite served as narrator. Every facet of what NASA does got some air time. Referring to Goldin’s tenure at NASA, Associate Deputy Administrator Dan Mulville said “his hand at the helm has been steady. There has been no greater champion – no greater cheerleader at NASA.” Noting that it is time honored military tradition for a retiring commander to be presented with the unit’s colors, Mulville said “I present you with the NASA Administrator’s flag that has been with you since 1992.” A few minutes later Mulville awarded Goldin the NASA Distinguished Service Medal. NASA Public Affairs Chief Glenn Mahone then introduced a series of TV clips “taken from around the agency” of people expressing their thoughts about Mr. Goldin. [Web posted. (2001). Dan Goldin Bids Farewell to NASA [Online]. Available WWW: <http://www.spaceref.com/> [2001, November 16].]

◆ Engineers are examining shuttle wheels for signs of corrosion before deciding whether such defects will hold up Endeavour’s Nov. 29 launch. Shuttle managers want to know whether Endeavour’s wheels have the same problems as wheels in storage found with corrosion. Endeavour’s set of six wheels cannot be inspected while the orbiter stands on the launch pad. The corrosion was found in holes that connect the wheel halves together. The marks were slight

– less than 1 centimeter – and are thought to be caused by the carbon dust kicked up at landing. [“Shuttle wheels are examined,” **Florida Today**, November 17, 2001, p 1B.]

NOVEMBER 20: The Spaceport Florida Authority adopted a new name and opened a new building Tuesday during a brief afternoon ceremony. Ken Haiko, chairman of the state agency, said the name Florida Space Authority conveys the growing scope of the organization to the space industry and the state lawmakers that fund its operation. The agency tries to diversify and protect Florida’s space industry. [“Florida Space Authority christens new name,” **Florida Today**, November 21, 2001, p 1B.]

◆ Dan Mulville made space shuttle safety his top priority Tuesday as he took charge of NASA, at least until White House nominee Sean O’Keefe’s Senate confirmation hearings. Mulville is the agency’s top-ranked official, having served as associate deputy administrator under former NASA Administrator Dan Goldin. The Senate-confirmation process is not expected to end until after the congressional holiday breaks. That would leave Mulville in charge until early next year. [“Top NASA official take reins until O’Keefe’s confirmation,” **Florida Today**, November 21, 2001, p 1A.]

NOVEMBER 21: A trace amount of anthrax spores were discovered at NASA Headquarters by a team of specialists testing federal buildings in Washington, the agency reported Wednesday. “The anthrax was a very tiny amount,” NASA Chief Medical Officer Richard Williams said Wednesday. “The infection potential is as low as it can possibly be while still be anthrax.” Williams did not prescribe any precautionary antibiotics for NASA employees. Six people work in the mail stop where the positive sample was found. The FBI is investigating the source of the anthrax, bureau spokesman Chris Murray said. [“Trace of anthrax found at NASA D.C. headquarters,” **Florida Today**, November 22, 2001, p 1A.]

NOVEMBER 22: Kennedy Space Center Visitor Complex will offer free admission to Kennedy Space Center workers and their families and to Brevard County residents today through Sunday, to mark its Salute to Brevard Residents Free Weekend. [“KSC lets Brevard residents in for free,” **Florida Today**, November 22, 2001, p 1C.]

NOVEMBER 25: When mission commander Dominic Gorie and his crew rocket into orbit this week, it will be amid unprecedented security during unprecedented times. Fighter jets, helicopter patrols, SWAT teams, military guards, closed roads, tourist bans, news media crackdowns and possibly anti-aircraft artillery are some of the safeguards expected to be in place for NASA’s wartime space shuttle launch. “We’re probably going to be some of the most well-protected people in the world,” said Gorie, a Navy captain and former combat pilot. No one at NASA is divulging any details. NASA went so far as to consider keeping Endeavour’s launch time a secret until minutes before liftoff. But because the time had been publicized, officials concluded it would be “not only inappropriate but ineffective” to classify the countdown and other mission events, flight director Wayne Hale said. For the first time in 20 years of space shuttle flights, only a select few will be on hand to watch the astronauts depart for the launch pad; journalists and most Kennedy Space Center employees will be barred. Space center roads typically reserved for launch spectators will be closed, even to the astronauts’ guests. [“Security tight for Thursday liftoff,” **Florida Today**, November 26, 2001, p 1A & 7A.]

NOVEMBER 26: Launch week began Monday with NASA managers meeting, astronauts training and technicians checking as Kennedy Space Center geared up for its first mission since August. United Space Alliance workers swung shuttle Endeavour’s pair of 60-foot-long cargo bay doors closed Monday evening in a final prelude to beginning the countdown to Thursday’s

launch. The crew arrived at Kennedy Space Center on Sunday (November 25). Weather stands as the greatest threat to the 7:41 p.m. launch time. Potential rain or thunderstorms provoked forecasters to call for a 60 percent change of an on-time launch. That chance climbs to 90 percent Friday. A momentary glitch in one of dozens of electronics boxes that sends data through the orbiter's computers will not comprise Endeavour's launch schedule, USA spokesman Jack King said. Mission managers have found no other technical flaws, King said. ["NASA starts countdown for shuttle," **Florida Today**, November 27, 2001, p 9A.]

◆ Air Force officials Monday unveiled the newest in a host of security measures to protect the upcoming shuttle launch: a radar as big and flat as a billboard and capable of detecting objects about 200 miles away. The state-of-the-art TPS 75 long-range air-surveillance radar rotates and can spot a plane traveling from near ground level to 100,000 feet, said Lt. Col. Randy Nelson, commander of the air-control squadron that operates the equipment. Rein would not provide specifics about how the radar will be used during Thursday's scheduled launch of the shuttle Endeavour. The radar, perched atop a 5-ton army truck, will be stationed at Cape Canaveral Air Force Station during the launch, Rein said. ["Long-range radar to guard shuttle launch," **Orlando Sentinel**, November 27, 2001, p A11.]

NOVEMBER 28: A Russian supply ship docked to the international space station Wednesday, but may not have latched properly into place. NASA officials said it was not immediately clear whether the potential problem would delay this evening's planned 7:41 liftoff of space shuttle Endeavour on a station delivery mission. The concern is that a loose fit might damage the orbiting complex because of the force imparted by a docking shuttle. Russia's Mission Control worked into the night to assess the problem and considered asking the space station's three residents for help early today. NASA spokesman Bruce Buckingham said shuttle managers would address the problem at the morning meeting prior to the fueling of Endeavour. ["Faulty docking may delay shuttle," **Florida Today**, November 29, 2001, p 1A.]

NOVEMBER 29: NASA administrators are debating when to launch shuttle Endeavour after delaying Thursday's planned liftoff because of potential danger from a Russian supply ship precariously docked at the International Space Station. The problem with the ship is apparently a cable or other debris that is blocking two sets of latches from engaging. A 34-inch diameter metal probe from the ship is lodged into the station's docking port adequately, but it provides less than a third of the strength of a normal connection. Russian space officials have signed a letter assuring NASA the shuttle linkup will cause no structural damage. Removing the debris will mean an impromptu spacewalk, but none of the details have been worked out. Russian and NASA controllers are considering several options. ["Docking flaw puzzles engineers," **Florida Today**, November 30, 2001, p 1A & 2A.]

◆ The Boeing Co. announced Thursday that Rear Adm. Stephen S. Oswald – a veteran of three space shuttle missions – will be Boeing's space shuttle vice president and program director effective Dec. 10. Oswald will be based in Houston and work closely with United Space Alliance and NASA's Johnson Space Center customers. "He will be spending a lot of time at the Kennedy Space Center, Houston and in Huntington Beach," said Kari Kelley Allen, a Boeing spokeswoman. ["Ex-astronaut to lead Boeing's space unit," **Florida Today**, November 30, 2001, p 1C.]

NOVEMBER 30: Space shuttle Endeavour's launch to the international space station has been pushed back at least to Tuesday so that spacewalking cosmonauts can try to fix a supply ship that is not docked properly at the outpost. The spacewalk is to be done Monday morning by the two Russian residents of the station, Vladimir Dezhurov and Mikhail Tyurin. If all goes well, the

shuttle would be cleared for a launch attempt at 5:45 p.m. Tuesday (December 4) from Kennedy Space Center. ["Endeavour must wait until Tuesday for launch," **Orlando Sentinel**, December 1, 2001, p A3.]

DECEMBER 2001

DECEMBER 3: With security tight, NASA eagerly cleared shuttle Endeavour for launch after a successful spacewalk at space station Alpha on Monday morning. There are no technical problems reported with the shuttle, and the forecast calls for an 80 percent chance of acceptable weather at the 5:45 p.m. launch time. The Federal Aviation Administration re-instituted a 30-mile no-fly zone for private aircraft throughout the launch. Air Force Maj. Mike Rein said security is as tight as possible, geared toward deflecting an attack like America suffered on Sept. 11. Helicopter gunships, fighter jets and armed vehicles have patrolled the Cape in the days leading up to the launch. Meanwhile, Russian cosmonauts Vladimir Dezhurov and Mikhail Tyurin removed an offending rubber seal that prevented the unmanned Russian cargo capsule from fastening fully to the back of Alpha. A series of latches quickly locked the spacecraft in place after the seal was dislodged. The work took less than three hours, even though ground controllers set aside almost six hours. The launch team at Kennedy Space Center watched the spacewalk closely, depending on its success to restart the countdown that has been frozen since Thursday. ["Security tight at KSC for tonight's launch," Florida Today, December 4, 2001, p 1A & 2A.]

DECEMBER 4: NASA will try to launch shuttle Endeavour again Wednesday after postponing Tuesday's attempt in the final minutes when rain clouds floated over the launch pad. Liftoff is set for 5:19 p.m. from Kennedy Space Center, where widespread security measures are being carried out to protect the shuttle and its seven-member crew. Endeavour will fly to the international space station with a new crew and more than 5,000 pounds of supplies. The station's current residents will ride back home on the shuttle. On Tuesday, the National Aeronautics and Space Administration carried the countdown to the final two minutes in the hope that rain clouds would dissipate. But the weather only grew worse as launch time approached, and clouds also drifted over the shuttle's landing strip, which must be clear in case the shuttle has to make an emergency return to Florida. ["Shuttle launch delayed as rain clouds roll in," Orlando Sentinel, December 5, 2001, p A11.]

◆ Watching its income slide since the Sept. 11 terrorism attacks, the Huntsville-based U.S. Space Camp Foundation is trying to sell some of its real estate, including the Astronaut Hall of Fame in Titusville. Larry Capps, executive director of the U.S. Space & Rocket Center, said the foundation hopes to sell the Astronaut Hall of Fame for \$4 million to NASA's Kennedy Space Center and Delaware North, the company that runs concessions for the Kennedy Space Center Visitor Complex. Local officials with Kennedy Space Center Visitor Complex would not comment on negotiations Tuesday. ["Space Camp plans sale of Astronaut Hall of Fame," Florida Today, December 5, 2001, p 1A.]

DECEMBER 5: Shuttle Endeavour is headed for the international space station after a tightly guarded liftoff Wednesday in the nation's first wartime shuttle launch. Delayed twice for technical problems and weather, Endeavour soared into the twilight sky at 5:19 p.m. from its Kennedy Space Center launch pad. In the first mission since Sept. 11, the National Aeronautics and Space Administration packed thousands of small flags, New York City police badges and other items aboard the ship in tribute to the victims of the terrorist attacks. "We're all well aware for over 200 years, and certainly over the past two months, freedom rings loud and clear across this country," said Endeavour's Commander Dominic Gorie from the cockpit before takeoff. "But right here, right now, it's time to let freedom roar. Let's light them up!" Beyond the symbolic gesture, NASA heightened security to unprecedented levels for Endeavour's flight. Air Force fighter jets enforced a 35-mile zone of restricted airspace around the launch pad. A

wayward private plane was intercepted Wednesday when it flew within 24 miles of the launch site, said Air Force Col. Sam Dick, vice commander of the 45th Space Wing at Patrick Air Force Base. A similar event occurred Tuesday, when an Air Force jet intercepted a helicopter that accidentally entered restricted airspace. On the ground, meanwhile, heavily armed military personnel were seen riding a Humvee outfitted with a .50-caliber machine gun, and the U.S. Coast Guard patrolled waters offshore. [“Time to let freedom roar,” **Orlando Sentinel**, December 6, 2001, p A7.]

◆ A 28-year-old South African internet tycoon looks set to become the second ever space tourist after three out of five Russian Space Aviation Agency departments have approved his mission to the International Space Station (ISS) in April 2002. In a separate agreement, the Russian Space and Aviation Agency has reportedly agreed to fly two U.S. television game show winners on Soyuz missions to the ISS in 2003. The other four ISS partners – NASA, Japan, Canada and ESA (European Space Agency) – would still have to agree to the trips. [Web posted. (2001). Two new space tourist deals lift-off [Online]. Available WWW: <http://www.newscientist.com/> [2001, December 5].]

DECEMBER 7: Senators made clear to President Bush’s choice to head NASA, Sean O’Keefe, that they don’t want his cost-cutting skills to be used to undermine the scientific goals of the international space station and other key NASA programs. In his current position at the White House Office of Management and Budget (OMB), O’Keefe has been sharply critical of space station cost overruns. O’Keefe, who is expected to win quick Senate approval, said his first task will be to identify the agency’s priorities so that in the long run he can “reinvigorate the entrepreneurial spirit that motivated the organization from its very beginning days.” He agreed with senators that reducing the ability of the space shuttle to conduct scientific research “would be a tragedy.” The 45-year-old O’Keefe served as Navy Secretary for Bush’s father and gained a reputation for his budget-cutting when he worked at the Pentagon in the early 1990s under then-Defense Secretary Dick Cheney. He’s been OMB deputy director since March. If confirmed, he replaced Daniel Goldin, who stepped down last month after serving as the National Aeronautics and Space Administration head for 9-and-a-half years. [Web posted. (2001). Senators question NASA nominee [Online]. Available WWW: <http://www.cnn.com/> [2001, December 7].]

◆ A South African Internet tycoon set to fly to the international space station in April said Friday that he will pay about \$25 million for his flight -- \$5 million more than the first space tourist paid the Russians. NASA has agreed to Mark Shuttleworth’s flight, reversing the U.S. space agency’s strong objection earlier this year when Russia first sold a seat on the station to a nonprofessional, Dennis Tito, an American. Shuttleworth, 27, said Friday that he would pay the extra money to conduct scientific experiments aboard the station, including work with stem cells. [“Next space tourist will pay more to do more,” **Orlando Sentinel**, December 8, 2001, p A8.]

DECEMBER 11: As part of a nationwide tribute to those who lost their lives in the attacks on America on Sept. 11, crew members aboard the Space Shuttle Endeavour and the International Space Station will mark the three-month anniversary of the attacks today, Dec. 11, 8:46 a.m. EST. Endeavour is orbiting the Earth with 6000 small American flags that are part of the agency’s “Flags for Heroes and Families” program. Also on board the shuttle are three large U.S. and Marine Corps flags, which were flying at the World Trade Center, the Pentagon and the Pennsylvania State Capitol, along with a number of New York City police officer shields and patches, a Fire Department of New York flag and a poster with the pictures of firefighters who lost their lives in the attacks. Those items will be distributed upon Endeavour’s return to Earth. [“Shuttle, ISS crews mark anniversary of Twin Towers tragedy,” **KSC Countdown**, December 11, 2001.]

DECEMBER 12: Advocates for keeping the NASA-Lockheed Martin X-33 space plane in one piece have lost the battle, with the experimental craft now being dismantled. On Monday, workers in Palmdale, Calif., where the X-33 sits, began the task of taking apart the flight-ready hardware. Now the high-tech leftovers of the X-33 will be divvied up between NASA and contractors to help cultivate work on next-generation space transportation concepts. ["Workers dismantle X-33 space plane," **Florida Today**, December 13, 2001, p 8A.]

DECEMBER 17: Shuttle Endeavour beat bad weather to Kennedy Space Center on Monday, fulfilling its crew's 12-day mission to exchange residents on space station Alpha. A layer of loosely formed clouds blanketed Commander Dom Gorie's view of Florida as Endeavour zipped over Sarasota and Central Florida before setting down on the Space Coast. The shuttle landed at 12:55 p.m. after 185 orbits of Earth. The landing wrapped up the sixth flight of the year, a pace NASA expects to continue next year. It ends the busiest year for the agency since 1997, when eight shuttle missions were launched. ["Shuttle brings home station crew," **Florida Today**, December 8, 2001, p 1A & 2A.]

DECEMBER 19: United Space Alliance officials said they have improved safety in NASA's fleet and driven down costs five years after taking over most aspects of the shuttle program and portions of the International Space Station. For the most part, NASA agrees, and wants to extend the contract that formed the company in 1996. USA has one more year on its initial six-year contract, but NASA intends to buy at least two more years of service from the company. The company wants the agency to sign on for four more years that would bring the total time to 10 years for \$12 billion. [Web posted. (2001). After 5 years, NASA wants to extend USA contract [Online]. Available WWW: <http://www.floridatoday.com/> [2001, December 19].]

◆ NASA Administrator nominee Sean O'Keefe passed his first Congressional hurdle Wednesday when the Senate Commerce and Transportation committee approved the selection in a voice vote. The full Senate must approve the White House choice before he can move into the agency's top post. There is no word yet on when that vote will come. ["Senate committee Oks O'Keefe as NASA chief," **Florida Today**, December 20, 2001, p 1B.]

◆ The Air Force evacuated Launch Pad 40 at Cape Canaveral Air Force Station after workers smelled a fish-like odor Wednesday morning. The smell turned out to be trace amounts of vapor from Aerozine 50 – a rocket fuel considered dangerous to inhale and can be corrosive. The launch pad is used by Titan 4 rockets, which use the fuel. Workers found a pinhead-sized hole in a hose on the fourth level of the mobile service tower around a Titan rocket. There was never a visible leak. ["Fishy odor clears Launch Pad 40," **Florida Today**, December 20, 2001, p 1B.]

◆ The next launch of shuttle Atlantis will slip two weeks so engineers can remove a rocket pod to examine a connecting point, NASA officials said. They're concerned about a slightly misshapen hole where the pod attaches to a rod on the orbiter's main body. Inspectors want to find out if the enlarged hole could cause the bolt passing through it to wiggle off and jeopardize the safety of the shuttle. Atlantis' new launch date is April 4, pushed back from March 21. The announcement came a day after the anticipated delay of shuttle Columbia's mission was revealed. The problem with that mission, slated for February, was with the Hubble Space Telescope the orbiter is to repair. One of the telescope's steering devices fluttered for seven minutes a month ago, prompting engineers to schedule a replacement. NASA tentatively has scheduled that mission for Feb. 21, but Hubble Space Telescope Project manager Frank Cepollina said Tuesday a two-week delay will be needed. Shuttle managers will take another look at the schedule in mid-January. ["Atlantis launch delayed 2 weeks," **Florida Today**, December 20, 2001, p 1B.]

◆ NASA has reopened its State Road 3 entrance to tourists going to the Kennedy Space Center Visitor Complex for the first time since Sept. 11. The change is in effect from 9:30 a.m. until 6:30 p.m. Kennedy Space Center remains at Force Protection Condition Charlie, its second-highest alert status. [“NASA reopens center’s State Road 3 entrance,” **Florida Today**, December 20, 2001, p 3B.]

DECEMBER 20: The NASA Advisory Council endorsed recommendations that the International Space Station program undergo a management facelift and be placed on fiscal probation for two years. The endorsement includes plans to limit the station to three residents instead of seven and reduce the shuttle launch rate to four a year in 2003. NASA and independent committees have been trying to figure out how to handle the program since it ran to a \$4.8 billion cost overrun in February. The council said NASA has to prove itself in the next two years if it is to ever build the kind of orbiting research laboratory it covets. [“NASA OKs plan to trim station use,” **Florida Today**, December 21, 2001, p 1A & 2A.]

◆ Sean O’Keefe was confirmed as NASA’s new Administrator by the U.S. Senate late Thursday. President Bush tapped the 45-year-old deputy director of the White House Office of Management and Budget last month, assigning O’Keefe the task of streamlining the space agency and reining in spending. The agency has been without a chief since Nov. 17, when Dan Goldin stepped down after leading NASA for nine years. It is not clear when O’Keefe will take the helm. [“New chief for NASA confirmed by Senate,” **Orlando Sentinel**, December 21, 2001, p A6.]

◆ NASA’s Kennedy Space Center, Fla., has extended the period of performance of the Payload Ground Operations Contract (PGOC) held for the last 15 years by The Boeing Company at Kennedy Space Center. The contract expires Dec. 31, 2001. This cost-plus-award-fee extension through March 2002 (with one-month options until July 2002) is valued at \$59.5 million and brings the total contract value to almost \$1.9 billion. The extension provides for coverage of payload ground support, test, integration and de-integration for space shuttle and expendable launch vehicle payloads. This action ensures uninterrupted program support through the PGOC and bridges the gap in performance between Dec. 31, 2001, and the awards of the follow-on contracts to PGOC —the Checkout, Assembly and Payload Processing Services (CAPPS) contract and the Expendable Launch Vehicle Integrated Services (ELVIS) contract. The original PGOC contract was initiated in January 1987 with McDonnell Douglas Space and Defense Systems. [“NASA Extends Boeing Payload Ground Operations Contract,” **NASA News Release #C01-bb**, December 20, 2001.]

DECEMBER 26: Although NASA’s budget and work force are roughly half what they were in the heyday of lunar landers and moon rocks, the agency still operates the same collection of field centers it had when Lyndon Johnson was President. For the first time in years, White House number crunchers and policy advisers are contemplating closing one or more of the NASA installations that helped win the Cold War space race with the former Soviet Union. “Everything is on the table as far as what’s being reviewed and looked at,” said Kirsten Larson, a spokeswoman at NASA headquarters. “We have a number of teams off looking at a variety of recommendations for different things that could streamline the agency.” Larson declined to discuss details of options already being vetted. Former NASA Administrator Dan Goldin said the review will reveal the civilian space agency is overbuilt for its missions, a finding that could lead to the closure of one of the 10 major field centers. Three test facilities – in New Orleans, Wallops Island, Va., and White Sands, N.M. – also could be on the table. The Johnson, Kennedy and Goddard space centers are considered the safest, given their congressional patrons and the central

role they play in core NASA missions. Ames Research Center in California and Glenn Research Center in Ohio are on some unofficial lists as vulnerable to closure or conversion to non-government-sponsored research parks. ["NASA sites could close," **Florida Today**, December 27, 2001, p 1A & 2A.]

◆ Negotiations over the next space tourist hoping to travel to the International Space Station have been delayed because of changes in NASA leadership, the head of the Russian Space Agency said Wednesday. ["NASA changes delay space-tourist talks," **Florida Today**, December 27, 2001, p 2A.]

DECEMBER 28: The next space shuttle could look like joined twins on the launch pad, or a cross between the current shuttle and a Saturn 5 rocket, the director of NASA's Space Launch Initiative said. Potential shapes will not be unveiled until spring, but the key to the designs are winged rockets that would carry a spacecraft to the edge of space, then turn around to land on a runway -- boosters included. NASA is counting on the new rockets to make operating the next space shuttles cheaper and safer. The so-called "fly-back booster" was included in early planning for today's shuttle but was deemed too technologically challenging and expensive. If the new designs show flexibility, they could be adapted to loft NASA's current orbiter fleet, said Dennis Smith, program manager for the five-year, \$4.8 billion effort to design a next-generation shuttle. ["NASA tests 'fly-back booster' design," **Florida Today**, December 29, 2001, p 1A.]

DURING DECEMBER: Kennedy Space Center's public home page has wrapped up an extensive redesign that provides a more visitor-friendly interface while making it easier to locate information. Visitor input was a driving factor in the look and functionality of the new design. Since May 2000, the last time the site underwent a design change, hundreds of comments were submitted via an online survey form. Patterns began to emerge and KSC Web managers designed the new home page using these suggestions as a guide. The result is an organized, compact page that serves as a portal to other parts of the site. ["KSC home page undergoes transformation," **Brevard Technical Journal**, December 2001, p 2-3.]

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